A STUDY OF CHALLENGES OF ICT ADOPTION BY SMALL AND MEDIUM SCALE ENTERPRISES (SMEs) IN IBADAN METROPOLIS, NIGERIA.

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MSc. IN INTERNATIONAL BUSINESS

BY

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Abstract

Numerous studies have been carried out on issues of ICT adoption by Small and Medium Scale Enterprises (SMEs) in developing countries of the world. These studies are carried out in recognition of the significant impacts of enterprises of this scale on the social and economic growth of nations. Furthermore, the studies have discovered that in those countries, the level of ICT adoption by SMEs is still very low, thereby negatively impacting their capacity to compete effectively. Consequently, it became necessary to compare the findings of such studies, especially on the challenges affecting the adoption of ICT by SMEs in a city like Ibadan.

From a sample size of 92, 53 SMEs from across different sectors of the economy participated in the survey. The data collection was done online, with a questionnaire developed to align with existing literature on the research focus. The survey findings were analysed and presented using descriptive statistics.

The findings revealed that the SMEs in Ibadan have adopted ICT, with the majority at the advanced stage of adoption. In addition, it was discovered that the perceived benefits of ICT form the major drivers of ICT adoption amongst the SMEs, while inadequate government support and issues of poor infrastructure were found to inhibit the adoption of ICT by SME owners in the area. Also, a Chi-Square test revealed that the level of ICT adoption in the area is influenced by the size of the business (p = .002), thereby confirming some earlier findings in that regard

The study has succeeded in adding to the existing body of knowledge in the topic area, while also providing insight into ICT adoption issues in another Nigerian city, in order to help policymakers develop a long-lasting and effective strategy to assist small businesses in the country be more competitive.

Keywords: SMEs, ICT, ICT adoption, Challenges of ICT adoption

Declaration

Submission of Thesis and Dissertation

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Date: 18th August, 2021

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Dedication

In memory of my beloved twin sister, Kehinde Adeyemo, she passed away before I started my Master studies.

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CHAPTER ONE

1.0 INTRODUCTION TO STUDY

1.1 Background to Study

The advent of information and communication technology (ICT) has brought about an impressive rate of development to different corners of the world. It has introduced efficiency and flexibility to different economic sectors at a rate that had never been seen before. For example, its application in sectors such as education, medicine, and agriculture has greatly improved service delivery, created opportunities, and facilitated inclusiveness, to an extent that gaps in the level of development between the developed and developing nations can be bridged (Mallika *et al*., 2018).

One of the economic sectors where ICT has been of great benefit is the small and medium-income enterprise (SME). Despite a complete lack of agreement on how to properly define SMEs, there seems to be a consensus on the variables involved in the definition; including quantitative criteria such as the number or size of employees, annual turnover, and total capital employed (Berisha and Pula, 2015). Accordingly, within the Nigerian context, the Bank of Industry (BOI) recognised SMEs as business establishments with an employee strength of less than 200, having a total asset and annual turnover of not more than 500 million Nigeria Naira—equivalent of 1.3 million USD (Bank of Industry, 2020).

Prior to the advent of ICT and its incorporation into businesses, it used to be that SMEs exist only in physical space, with operations restricted to a specific geographic boundary, while business processes such as bookkeeping and inventory were done with actual books, and communication was a constant challenge. However, SMEs worldwide now recognise the capability of ICT and now incorporate it in advancing

their businesses beyond the physical space, using computer systems to manage paperwork, employing the use of technology to improve on production and services, and maximising email and social media for improved communication (Mallika *et al*., 2018; Sewanu, 2015; Lucchetti and Sterlacchini, 2004).

SMEs have benefitted greatly from this incorporation of ICT into day-to-day operations. For example, such SMEs have benefitted through increased sales, improved communication, greater efficiency, increased productivity, competitiveness, and globalisation (Okundaye, Fan and Dwyer, 2019; Rahayu and Day, 2017). Consequently, these SMEs are better positioned to contribute to economic growth and development in their various countries, through job creation—accounting for up to 99% of employers—and contribution to gross domestic product (GDP)—at over 50% (Napitupulu *et al*., 2018; Zafar and Mustafa, 2017).

However, regardless of the potential for job creation and overall economic development through SMEs with adoption and incorporation of ICT, there has been a series of evidence of the low rate of adoption of ICT by SMEs in developing countries, with factors limiting the adoption including the cost of operation and maintenance, attitude, inadequate knowledge, security and privacy issues, as well as concerns about service reliability (Napitupulu *et al*., 2018; Rahayu and Day, 2017; Zafar and Mustafa, 2017; Jahanshahi, *et al.*, 2013). This situation is equally applicable to Nigeria, with notable challenges of adoption including inadequate knowledge and ICT skills, limited understanding of ICT benefits, cost, lack of government policies, culture and attitude, and inadequate infrastructure (Okundaye *et al*., 2019; Oyebiyi, 2019; Agwu and Murray, 2015; Apulu, *et al*., 2013; Aleke, *et al*., 2011).

Conclusively, it is clear that ICT is responsible for innovations in different economic sectors including the SME, with direct results being increased sales, competitiveness, and a greater level of flexibility in general business operation. This has consequently led to job creation and economic development in developed countries with a greater ICT adoption rate, while SMEs in developing economies like Nigeria have yet to fully adopt ICT. This situation, therefore, poses an implication on social and economic development, and thus forms the background for this study which intends to assess the challenges to the adoption of ICT by SMEs in Ibadan, Oyo State, Nigeria.

1.2 Statement of Research Problem

As observed by numerous studies, including that of Okundaye *et al*. (2019) and Tob-Ogu, *et al*., (2018), there are several differences between SMEs and larger firms, some of which put SMEs at a disadvantage. For example, larger firms are likely to possess a deeper financial resource base, easier accessibility to long-term loans, and a larger staff strength with an advanced level of specialisation, ensuring their competitiveness both within and beyond national borders.

Nevertheless, other studies have shown that ICT possesses the capability to level the playing field between larger firms and SMEs if properly adopted and effectively implemented (Díaz-Chao *et al*., 2015; Lucchetti and Sterlacchini, 2004), with benefits including greater efficiency, increased productivity, improved communication, increased sales, and competitiveness (Okundaye *et al*., 2019; Dincer and Dincer, 2017; Rahayu and Day, 2017).

However, evidence abounds that the developing countries SMEs rate of ICT integration into the business operations is very low (Napitupulu *et al*., 2018; Rahayu and Day, 2017; Zafar and Mustafa, 2017; Jahanshahi *et al*., 2013), citing several factors that are

mostly not dissimilar, including the cost of operation and maintenance, attitude, inadequate knowledge, security and privacy issues. Also, according to a variety of studies carried out in Nigeria, SMEs are still behind in their adoption and incorporation of ICT due to a number of challenges inhibiting effective adoption (Okundaye *et al*., 2019; Oyebiyi, 2019; Agwu and Murray, 2015; Apulu *et al*., 2013; Aleke *et al*., 2011).

The foregoing therefore poses a great risk of missing out on the numerous benefits of ICT for SMEs in Nigeria. A situation that could be detrimental to socio-economic development if ignored. This, therefore, provides a problem that this study intends to solve through understanding the level of adoption and incorporation, as well as factors that drive the use of ICT, and the militating challenges to its effective adoption by SMEs in Ibadan, Oyo State of Nigeria, thereby contributing to the existing body of knowledge on the topic.

1.3 The Rationale for the Study

The contribution of SMEs to socio-economic growth and development cannot be overemphasised. In the majority of the countries of the world, they are the highest employer of labour, with a strong contribution to national GDPs (Napitupulu *et al*., 2018; Zafar and Mustafa, 2017; Agwu and Murray, 2015; Gbandi and Amissah, 2014). However, the Nigerian situation has revealed that albeit the SMEs representing the major employer of labour in the country, their contribution to national GDP is poor (Gbandi and Amissah, 2014). However, studies have shown that the major determinant is in the differing level of ICT adoption between developed and developing countries (Agwu and Murray, 2015; Lucchetti and Sterlacchini, 2004).

Several researchers have carried out studies on ICT and SMEs in Nigeria. However, the most recent of these studies ascertained that the adoption rate of ICT by SMEs in

the country is still low (Okundaye *et al*., 2019). As a result, it becomes necessary that another study be carried out to determine the extent of adoption, as well as the militating factors. Moreover, with the number of studies conducted in Nigeria, none has been carried out in Ibadan, Oyo State—a city in the southwest region of Nigeria, and one of the major cities in Africa—with several studies limited to Lagos State (Okundaye *et al*., 2019; Agwu and Murray, 2015; Sewanu, 2015; Apulu *et al*., 2013; Irefin, *et* al., 2012). Consequently, this study intends to find out if the SME situation regarding ICT adoption also applies to SMEs in Ibadan.

Conclusively, if the socio-economic situation of Nigeria is to change for the better, greater attention must be given to the development of SMEs as the highest employer of labour, particularly in the face of the high unemployment rate and the poor financial outlook—brought about by dwindling oil prices—in the country. This study will contribute to the existing body of literature by providing new and original insight into the level of adoption of ICT by SMEs in Nigeria, as well as revealing the militating factors to effective adoption of ICT by these SMEs. This will help the government and relevant policy makers make sustainable policies to improve the status of SMEs in Nigeria.

1.4 Research Questions

In view of the research problems, the following are the research questions that this study intends to answer;

a. What is the level of ICT adoption of SMEs in Ibadan?
b. What factors drive the adoption of ICT by SMEs in the study area?
c. What are the challenges militating against ICT adoption by SMEs in the study area?

1.5 Aim and Objectives of the Research

This study intends to assess the level and challenges of ICT adoption by SMEs in Ibadan, Oyo State, Nigeria. In order to answer the research questions, the specific objectives of the study are as follows;

a. To determine the level of adoption of ICT by SMEs in Ibadan;
b. To understand what factors drive ICT adoption by SMEs in the study area; and
c. To assess challenges inhibiting the adoption of ICT by SMEs in the study area.

1.6 Research Hypotheses

The following hypotheses are formulated and tested for this study

1) H0: There is no significant relationship between the level of ICT adoption and the size of SMEs in Ibadan Metropolis.
2) H0: There are no significant differences in the perception of ICT adoption drivers amongst SMEs in Ibadan.
3) H0: There is no significant relationship between perception of challenges and level of ICT adoption of SMEs in Ibadan.

1.7 Scope of Study

This study focuses on the challenges of ICT adoption by small and medium scale businesses in Nigeria. In order to effectively do this, the study assesses the present level of adoption of ICT by the SMEs, as well as factors driving adoption amongst the SMEs. Finally, factors inhibiting the effective integration of ICT into their businesses are evaluated. Moreover, in contrast to studies that focus on specific sectors within SMEs, the study focuses on a cross-section of SME sectors available within the study area.

On a geographical scope, this study concentrates on small and medium businesses in the metropolitan area of Ibadan, Nigeria. This consists of only 11 Local Government Areas (LGAs).

1.8 Structure of the Dissertation

Subsequent to the introduction of the study, the rest of the dissertation is sub-divided into four chapters. Chapter two focuses on a review of the extant literature on issues of ICT adoption by small and medium scale enterprises. Such issues comprise an appraisal of the contributions of SMEs to socio-economic development, as well as the disparity in the level of ICT adoption by SMEs in developed and developing nations. Furthermore, benefits of ICT as perceived by SMEs owners are identified, as well as specific factors that drive their ICT adoption. Finally, the challenges of SMEs in integrating ICT in their business ventures are elaborated on.

On the other hand, chapter three provides a detailed discussion on the methodology adopted for the research. This includes discussions on the identification of the research population and sampling procedures. Furthermore, issues of data needs and sources are discussed, along with matters relating to data collection for the research. Finally, discussions on data analysis and presentation methods conclude the section.

Chapter four focuses on the analysis of collected data, their presentation and discussions. This is organised to be in line with the research objectives in order to ensure that the research work follows a structured arrangement. Chapter five provides a discussion of the findings, while chapter six concludes the research work by summarising research findings and proffering possible recommendations to identified challenges inhibiting ICT adoption by SMEs in Ibadan, Nigeria.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This section details the review of relevant literature, especially on issues concerning the adoption of ICT by small and medium scale enterprises. The section is divided into two major parts, namely; a review of conceptual framework and a review of theoretical framework. The first part covers models on stages of ICT adoption as advanced by Kotelnikov (2007) and Rao *et al*. (2003). The second part is further subdivided into four parts. The first part covers issues of SMEs and their contribution to socio-economic development, where matters of defining what differentiates SMEs from large enterprises are reviewed. Furthermore, the second part touches on topics of ICT adoption by SMEs in both developed and developing nations with a special focus on Nigeria situation. The third part discusses factors that drive ICT adoption by SMEs in developing countries and particularly in Nigeria, including the perceived benefits of ICT adoption to SMEs.

Finally, the challenges of ICT adoption by SMEs specifically focuses on the Nigerian situation according to previous studies focusing on the local environment for small and medium scale businesses. To conclude the section, a summary of the literature review is provided, and models are proposed for the research objectives.

2.2 Conceptual Framework

2.2.1 Stages of ICT Adoption

Existing literature have indicated that there are different levels of ICT adoption by organisations, which is also a function of stages of ICT development. This suggests that the adoption of ICT by firms undergoes different stages of development brought about by different factors. To explain this phenomenon, numerous researchers have come up

with different models. One of such models is "Richard Nolan's stages of growth model" (Rahayu and Day, 2017, p. 29). According to the model, there are six stages of ICT adoption, comprising of initiation, contagion, control, integration, data administration, and maturity. However, instead of actual stages where organisations can advance from one stage to the other, increasing their level of adoption, Rahayu and Day (2017) observed the six stages all exist together. This suggests that an organisation could be in multiple stages or levels of adoption at a time. Subsequently, this model led the way for subsequent models on stages of adoption of ICT, a number of which identified its shortcomings and proffered alternatives.

In another dimension, other researchers have adapted growth models of ICT adoption to e-commerce. Based on previous works done by O'Connor and O'Keefe (1997) and Timmers (1999), Rao *et al*. (2003) proposed a model of actual stages of development, with each subsequent stage advanced than the previous one, both in terms of technology and cost. According to the authors, there are four stages, comprising of presence, portals, transactions integration, and enterprise integration. Although the stages appear to be sequential, they explained that organisations can begin at any stage taking into consideration the drivers and barriers to each stage. Other models who have followed this line of thought include Rahayu and Day's (2017) e-commerce stages of growth model based on the work of Pranatao *et al*. (2003) who identified six stages, including no presence, static website presence, interactive online presence, electronic commerce, internal integration and external integration.

However, because of the general nature of SMEs considered in this research, it is important to consider a model that explains the levels or stages of ICT adoption on a general level. One of such models is that of Kotelnikov (2007) who proposed a progression of ICT adoption from basic to advanced technology. The author identified

four stages of ICT adoption comprising of (i) basic communications (ii) basic information technology (iii) advanced communications and (iv)advanced information technology. As organisations advance from one stage to the other, the technology required becomes more complex and requires increased investment.

- *Basic Technology*

This represents the first stage of ICT adoption involving the use of basic communication hardware such as mobile phone or a fixed land line. The aim in this stage is basically to facilitate communication with clients and staff members alike. The adopted communication tool in this stage is a function of convenience and cost.

- *Basic Information Technology*

The next stage in the progression of ICT adoption is the basic information technology. This stage involves the application of computers and basic software for organisation operations. Under this stage, internet connectivity is not necessary, as organisations are only concerned with the integration of PCs and basic software into organisational processes for improved productivity. Here software such as the Microsoft Word package could be used in the preparation of mails which are then printed from a connected printer and dispatched, and the Excel package could be adopted for basic accounting processes.

- *Advanced Communications Technology*

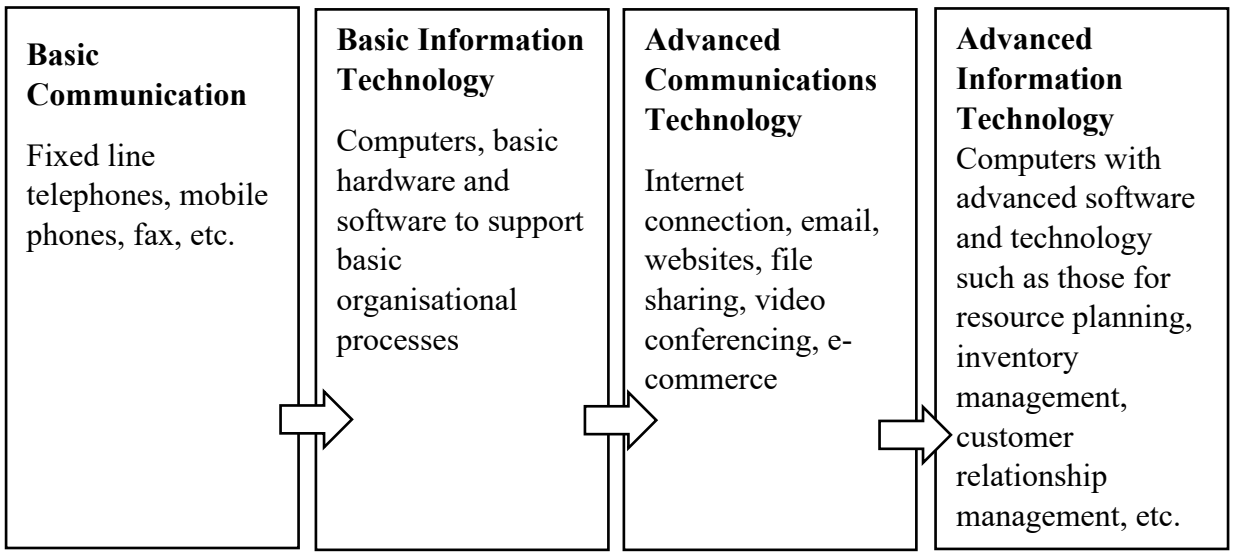
The third stage is the advanced communications technology stage. In this stage, organisations are now beginning to explore the opportunities of internet connection. They now exploit internet connectivity for advanced communication practices involving the email system, website, file sharing and, video conferencing for enhanced

customer relations and wider market reach. Also, in this stage, some organisations may feel the need to incorporate e-commerce capabilities within their websites.

- *Advanced Information Technology*

The advanced information technology stage is the most advanced stage in Kotelnikov's (2007) progression of the ICT adoption model. Here some organisations—depending on their specialisation—are not effectively served with the advanced communications technology capabilities. Consequently, they adopt even more advanced technology involving more sophisticated tools used for resource planning, inventory management, databases, and advanced project management tools with project planning and management capabilities.

Figure 1: Kotelnikov's Stages of ICT Adoption



Source: Kotelnikov (2007)

2.3 Theoretical Framework

2.3.1 SMEs and Contribution to Socio-economic Development

The importance of small and medium enterprises (SMEs) to economic growth cannot be overemphasised. However, albeit the well-documented contributions, the lack of consensus on how to properly define SMEs has been well documented by literature

(Berisha and Pula, 2015). The authors noted that there are three major sources of the various definitions of SME, namely; international organisations, national laws, and industry definitions. Nonetheless, they seem to agree on the adoption of quantitative criteria to define businesses that are not considered large enterprises. These criteria as proposed by organisations such as the European Commission and The World Bank include the number of employees, total assets, and annual turnover. According to the definition of these organisations, for an enterprise to fall within the classification of SME, they must meet the criteria on employee size, and either financial criteria (Berisha and Pula, 2015).

Table 1 – World Bank Definition of SMEs

Category of Enterprise	**Number of Employee**	**Total Assets**	**Annual Turnover**
Micro	<10	≤ $100,000	≤ $100,000
Small	>10 - ≤50	>$100,000 - ≤$3,000,000	>$100,000 - ≤$3,000,000
Medium	>10 - ≤300	>$3,000,000 - ≤$15,000,	>$3,000,000 - ≤$15,000,

Source: Berisha and Pula, 2015, p. 19

Furthermore, the definition of SMEs as advanced by the international organisations presented three classifications of SMEs namely; (i) micro enterprises, (ii) small enterprises and (iii) medium enterprises. Also, the international criteria for defining SMEs have formed the basis for national and industry-specific definitions, and as such been adapted to fit different economies and/or industries. For example, according to the Organisation for Economic Cooperation and Development (cited in Berisha and Pula, 2015), countries in Europe adopt the European Commission's definition of SMEs, with the employee strength criterion of less than 250 employees, while other countries define SMEs as having a number of employees different to the European Commission and The

World Bank. For example, in New Zealand, the figure is less than 100 and less than 200 in Australia. In contrast, in the United States and Canada, any organisation with a number of employees of fewer than 500 are categorised into an SME. In the same vein, the Bank of Industry (BOI) defined SMEs as limited to a number of employees fewer than 200 and a total asset of not more than ₦500 million, equivalent to about $1 million. The basis of the amount of attention that SMEs has garnered thus suggests their importance.

Table 2 – Nigerian Bank of Industry Definition of SMEs

Category of Enterprise	**Number of Employee**	**Total Assets**	**Annual Turnover**
Micro	≤10	≤ ₦5,000,000	≤ ₦20,000,000
Small	>11 - ≤50	> ₦5,000,000 - ≤ ₦100,000,000	≤ ₦100,000,000
Medium	>51 - ≤200	> ₦100,000,000 - ≤ ₦500,000,000	≤ ₦500,000,000

Source: Bank of Industry (2020)

The importance of SMEs to socio-economic development has been repeatedly emphasised by various literature over time. In a lot of countries, SMEs make up the majority of employers, providing employment to a large percentage of the populace. For example, in developed countries such as the United Kingdom, Canada and the United States of America, SMEs account for over 99% of total enterprises. Similarly, in Switzerland, SMEs are responsible for over 70% of the total employment, while SMEs in Canada employ over 60%. In the United States of America and the United Kingdom, SMEs are responsible for over half of the total employment (OECD, 2010). However, SMEs in developing countries have been noted to play an equally major role in employment. In Indonesia for instance, SMEs account for virtually all (99%) of the total establishments (OECD, 2018). This is not dissimilar to the situation in Thailand

where SMEs make up 99.7% of establishments, accounting for close to 80% of total employment (OECD, 2011). In Nigeria, Apulu *et al*. (2013) stated that SMEs account for about 97% of the total establishments across different economic sectors in the country.

Conclusively, despite varying ideas on defining what categories of businesses make up the SME class, the consensus is on using employee size, annual turnover and/or total assets as criteria. Similarly, regardless of slightly varying figures, it has been proven that SMEs represent the majority of establishments and in the same vein contribute massively to employment both in developed and developing nations. This, therefore, underlines the importance of SMEs as a potential catalyst for socio-economic growth and development, particularly in developing nations, and highlights the need for their effective adoption of ICT to drive their businesses and improve their contribution to socio-economic growth and development.

2.3.2 The Levels of ICT Adoption by SMEs in Developed Countries and Developing Countries

Information and communication technology or simply ICT has been proven to be a catalyst of growth across different economic sectors. According to Modimogale and Kroeze (2011), ICT covers a wide array of technological hardware such as telephone, point-of-sale system, computers, internet and, credit card facilities. However, Tob-Ogu *et al*. (2018), proposed a comprehensive conceptualisation of ICT as comprising of hardware, software and configurations that enable interactions and relevant processes, including information acquisition, processing and exchange as required by the user. This study, therefore, adopts this definition of ICT as a system comprising of hardware, software and configurations, all of which function in an integrated manner to serve the needs of the user—which in this case is SMEs.

Furthermore, Lucchetti and Sterlacchini (2004), analysed different categories of ICT adopted by SMEs in Europe and classified these into three broad categories, comprising of general-use, production-integrating, and market-oriented. According to the researchers, general-use ICT include the adoption of basic ICT capabilities such as e-mail and basic internet access. In contrast, the production-oriented category involves the incorporation of hardware, software and configurations into the production process and general functionality of SMEs. This category is more advanced than the general-use category and consequently requires more sophisticated ICT components and installations, as well as better technological skills. Finally, the market-oriented category involves exploiting ICT to improve visibility and target a wider market reach for products and services offered by SMEs.

However, analysis of ICT adoption by SMEs in developing nations has shown different levels of adoption, suggesting that the rate of adoption is still far behind what is required to position them to benefit on a large scale. For example, Rahayu and Day (2017), in their study of ICT adoption in Indonesia revealed that the majority of the SMEs have adopted the market-oriented ICT tools. Furthermore, they categorised the level of ICT adoption into six stages and found that some SMEs are yet to adopt ICT while more than 20% of them have only adopted basic ICT capabilities. Similarly, Ashrafi *et al*. (2014) in their study of SMEs in Oman found that only a few of the SMEs sampled have adopted advanced ICT capabilities relative to the basic ICT use.

This situation is not different in Nigeria. For instance, the study of Tob-Ogu *et al*. (2018) on how the road freight transport sector in Nigeria have adopted ICT in their operations revealed that ICT tools are used by the firms to conduct monitoring of operations, to ensure accountability and improve on visibility. However, the authors observed that large enterprises incorporate relatively advanced ICT tools into their

operations compared to SMEs. In the same vein, Apulu *et al*. (2013) identified different ICT tools employed by SMEs in Nigeria to range from the basic telephone with no internet connection, through PC with Microsoft packages and CAD-enabled software. However, they also found that over one-third of SMEs are non-users of ICT. This is also not dissimilar to the findings of Uweigbe and Olatunji (2009) who found a low level of ICT adoption amongst a cross-section of SMEs measured through the number of computer systems available and connected to the internet. These researchers and others that have conducted similar studies in Nigeria have found a number of challenges resulting in the low level of adoption of ICT by the various SMEs.

Conclusively, the review of literature under this section has revealed that although SMEs in developing countries have made efforts in adopting ICT for their businesses with varied applications in different sectors, their level of adoption is still relatively basic, with a host of challenges militating against their effective adoption. This, therefore, suggests that more is still required to be done in understanding the factors that drive ICT adoption by SMEs, as well as those that inhibit effective adoption in developing countries.

2.3.3 Factors Influencing ICT Adoption by SMEs in Developing Countries

Several extant literature have captured factors that drive ICT adoption by SMEs in developing countries. According to these studies, the adoption of ICT by small and medium scale enterprises is a function of several factors. These include technology type (Nafiu *et al*., 2020; Okundaye *et al*., 2019; Ashrafi *et al*., 2014), size of business (Nafiu *et al*., 2020; Lu *et al*., 2019; Irefin *et al*., 2012), social networks (Aleke *et al*., 2011) and perceived benefits accruable from ICT adoption (Lu *et al*., 2019; Okundaye *et al*., 2019; Tob-Ogu *et al*., 2018; Rahayu and Day, 2017; Jahanshahi *et al*., 2013).

- *Technology type*

According to Nafiu *et al*. (2020), Okundaye *et al*. (2019) and Ashrafi *et al*. (2014), type of technology is one of the considerations of SME owners in adopting ICT for their businesses. On the one hand, SME owners tend to adopt ICT for their businesses based on the type of technology that is readily available to them, a factor which has the undertones of infrastructure, ICT skills, and finance. On the other hand, this could be on the basis of needs. This way, smaller organisations are likely to have no use for complex types of ICT technology, thus adopting basic ICT types such as mobile phones, email and static websites, which are easiest for them to come by and require less investment. (Okundaye *et al*., 2019).

- *Size of business*

The size of SMEs is another factor that influences ICT adoption amongst SMEs. For example, the study of Nafiu *et al*. (2020) who investigated the relationship between some key factors and ICT adoption found that size is a major determinant. The authors investigated how technology type, technical strategy, perceived benefits, perceived ease of use and other factors influence ICT adoption and found that size is one variable influencing the results. For example, owners of small businesses perceived less benefit and less ease of use of ICT relative to larger businesses. Similarly, Irefin *et al*. (2012) found that larger businesses with considerable financial resources, personnel and operation size are more inclined to adopt ICT relative to smaller enterprises. This also correlates with the findings of Lu *et al*. (2019) and Afolayan *et al*. (2015).

- *Social networks*

The social network is one of the lesser factors influencing ICT adoption. A discovered by Aleke *et al*. (2011) who studied ICT adoption by agribusinesses in Nigeria, strong

social ties amongst SMEs in similar sectors could drive ICT adoption by the SMEs. Adoption of certain ICT tools by one or some within these networks could influence the diffusion across boards.

- *Competition*

Lu *et al*. (2019) found that competition could drive ICT adoption by SMEs. This means that SME owners tend to adopt a particular type of technology if they perceive that similar businesses have adopted the same. The authors in employing inferential statistics found that this moderately influences ICT adoption.

- *Perceived benefits of ICT adoption*

The perception of SMEs on the benefits accruable from ICT adoption is another major factor influencing the adoption. (Lu *et al*., 2019; Okundaye *et al*., 2019; Tob-Ogu *et al*., 2018; Rahayu and Day, 2017; Jahanshahi *et al*., 2013). SME owners as investigated by these studies were of the view that ICT could help them achieve a number of benefits broadly grouped by Lu *et al*. (2019) into value and strategic benefits. These include benefits such as increased competitiveness, increased sales, extended market reach, improved accountability, enhanced productivity and effectiveness, and reduced cost.

In the study of Tob-Ogu *et al*. (2018), it was revealed that SMEs involved in the freight transport sector identified ICT as improving their level of competitiveness. The SME owners declared that the use of ICT increases their efficiency by reducing the time of service delivery, at the same time increasing accuracy. In the same vein, Okundaye *et al*. (2019) found that SME owners believe that adopting ICT can help them achieve competitiveness both locally and globally. Finally, the studies of Tarute and Gatautis (2018) and Rahayu and Day (2017) also supports the view that competitiveness is a benefit of ICT adoption amongst SMEs, driving their ICT adoption.

Additionally, extended market reach and increased sales are other perceived benefits of ICT adoption which influence the decisions of SME owners to integrate ICT into their businesses. For example, as revealed from the study by Rahayu and Day (2017) these are the top two benefits perceived by SME owners in Indonesia. ICT adoption provides means to increase sales through extended market reach. This means that online presence increases visibility for businesses and enables them to reach relatively far more customers compared to their physical location, and this consequently improves their capacity to compete. Similarly, Lu *et al*. (2019) and Jahanshashi *et al*. (2013) found increased market share, enhanced productivity and work effectiveness, enhanced company brand and corporate image, reduced labour and operation costs, and enhanced competitive advantage are other perceived benefits influencing the adoption of ICT by SME owners.

Conclusively, this section has been able to show specific factors that are integral to the decision of SME owners to adopt ICT for their businesses. Additionally, it shows that the benefits of ICT as perceived by SME owners are important factors. Therefore, if SME owners are not adequately aware of or perceive the benefits of integrating ICT in their businesses, they are not likely to do so, while on the other hand, SMEs will adopt ICT if they perceive that it could drive their businesses positively (Lu *et al*., 2019; Okundaye *et al*., 2019; Agwu and Murray, 2015; Jahanshahi *et al*., 2013).

2.3.4 Challenges of ICT Adoption by SMEs in Nigeria

The ICT adoption rate in developing nations has been found to be at the early stage relative to countries in the developed world. The situation in Nigeria is not very dissimilar to what obtains in other developing countries such as Indonesia, Iran, Ghana, and South Africa (Nafiu *et al*. 2020; Okundaye *et al*., 2019; Oyebiyi, 2016; Apulu *et al*., 2013; Uweigbe and Olatunji, 2009). According to the existing literature on the

challenges of ICT adoption by SMEs in Nigeria, numerous but similar factors are observed. These factors are broadly grouped into internal and external environmental factors, perceptions, and attitudes (Agwu and Murray, 2015).

Internal environmental factors limiting ICT adoption are those that are within the control of organisations, including the size of business, ICT skills, and availability of relevant resources. External environmental factors on the other hand are those that are right beyond the control of SMEs, such as inadequate infrastructure to support ICT adoption, unfavourable government policies are some of the factors identified. Perception factors include risks associated with ICT adoption, and perceived cost of ICT adoption and operation, while factors of attitude encompass cultural factors and personal attitude towards ICT adoption. Some of these factors are discussed as follows:

- *Inadequate infrastructure*

Perhaps the biggest challenge of ICT adoption in Nigeria is that of infrastructure for enabling the business environment. This was repeatedly cited as a major challenge in studies such as Okundaye *et al*. (2019), Agwu and Murray (2015), Apulu *et al*. (2013), Irefin *et al*. (2012) and Uweigbe and Olatunji (2009). These researchers discovered that erratic power supply, poor internet connection, poor mobile telecommunication connection and expensive internet service are factors inhibiting ICT adoption by SMEs in the country. According to Agwu and Murray (2015), most of the areas surveyed had outdated and unreliable telephone connections with erratic internet services. Also, the authors found that the necessary infrastructure for widespread ICT usage is lacking.

- *Lack of ICT skills*

Inadequate or complete lack of ICT skills is identified as an internal environmental factor observed to be militating against effective ICT adoption in Nigeria. For example,

Okundaye *et al*. (2019) found a lack of ICT competence as a challenge of ICT adoption. This is similar to the findings of Agwu and Murray (2015) who discovered that some SME owners lack requisite ICT competency. Finally, according to the study of Apulu *et al*. (2012), lack of ICT skill forms the second biggest challenge of ICT adoption in Nigeria, with their study revealing that close to half of SME owners have a deficiency of ICT skills limiting their integration of ICT.

- *The perceived cost of operation and maintenance of ICT tools*

The issue of the financial implication of adopting ICT came up in numerous studies as one of the factors that inhibit effective adoption by SMEs in Nigeria (Okundaye *et al*., 2019; Oyebiyi, 2019; Jahanshashi *et al*., 2013; Apulu *et al*., 2012). This is often attributed to the prohibitive cost of ICT hardware, software and peripheral components, including the computer system, relevant software, internet modems and subscription. As observed by Okundaye *et al*. (2019) the cost of investing in the necessary technology and skill for ICT adoption is usually beyond the financial capability of small businesses, thus either limiting their level of adoption or generally resulting in their having to completely forgo ICT adoption. This is not far apart from the findings of Apulu *et al*. (2013) that perceived cost is one of the top five factors limiting the adoption of ICT by SMEs.

- *Insecurity and related risks*

From the review of literature, insecurity and perception of risks appear to be a major inhibitor of ICT adoption amongst SME owners in Nigeria. (Okundaye *et al*., 2019; Agwu and Murray, 2015; Apulu *et al*., 2013). These studies revealed that some SME owners aired concerns on the security of their business and client information if they adopt ICT. According to Agwu and Murray (2015), some SME owners lack confidence in the ability of ICT to protect their business information based on reports circulating

the airwaves. Some other concerns identified include the possibilities of hacking, identity theft, and losing their money to fraudsters, which is something organisations of their size cannot afford.

- *Inadequate government support*

Another challenge that has been found to be peculiar to Nigeria on ICT adoption by SMEs is inadequate support by the government. As found by Okundaye *et al*. (2019), Oyebiyi (2016) and Irefin *et al*. (2012) government support impacts rate and level of ICT adoption by SMEs in the country. As noted in the studies, inadequate infrastructure, unfavourable business environment, inadequate ICT skill and limited financial capabilities are some of the militating challenges of ICT adoption that can be alleviated by government support. However, what obtains in the country is a lack of support in facilitating ICT adoption, through favourable policy and regulation development, installation of ICT infrastructure, technical training on ICT skills, and financial support for SMEs.

- *Culture and attitude*

Culture has also been identified as a factor militating against ICT adoption in Nigeria. According to Agwu and Murray (2015), some SME owners are wary of the acceptance of clients and customers with e-transactions, especially involving exchange of money for services. The authors noted that some of the SME owners interviewed declared that while it might be beneficial to adopt ICT for some business processes, but it is the Nigerian way to sell products or offer services and receive money with your hands. This is also similar to the findings of Osubor and Chiemeke (2015), while Aleke *et al*. (2011) had earlier found that SMEs in the agricultural sector are wary of the possible disruption that ICT may introduce in their groups. However, Okundaye *et al*. (2019) found that culture is a minimal challenge of ICT adoption amongst SMEs in Nigeria.

2.5 Summary of Literature Review and Model Specification

From the numerous studies reviewed for this research, it is clear that the identification of which businesses fall within the small and medium scale is a function of quantitative variables including employee size and financial factors, all of which are further adapted to the socio-economic contexts of different regions. Additionally, it has been proven that SMEs are drivers of social and economic growth and development in many nations of both the developed and developing world.

However, studies have shown different categories of adoption and revealed that the rate of adoption between the developed and developing nations differs significantly, and this poses a challenge. It has been observed that the adoption of ICT by SMEs in most developing countries including Nigeria is major of the basic ICT tools, a situation which has been ascribed to numerous factors.

Furthermore, extant literature has shown that adoption of ICT by SMEs is a function of numerous factors, some of which drive adoption and some of which inhibits adoption. These range from factors of infrastructure for ICT adoption and sustainability, financial factors, limited awareness of benefits, perceptions of insecurity, limited ICT skills, social networks, to perceptions of benefits accruable from ICT adoption.

Finally, several benefits have been noted by adopters of ICT amongst SMEs. These benefits are well captured to include the capacity to drive businesses and improve their competitiveness, achieve extended market reach and increase sales, improve accountability, and improve customer relationships. Therefore, based on the review of conceptual and theoretical literature, this research adopts the following variables as shown in fig 2, 3 and 4. In order to determine the level of ICT adoption by SMEs in the study area, the variables considered are basic technology, basic information technology,

advanced communications technology, and advanced information technology. Also, on factors driving ICT adoption by SMEs, the research considered variables such as technology type, business size, social networks, competition, and perceived benefits (increased competitiveness, increased sales, extended market reach, improved efficiency, enhanced productivity, enhanced company brand and corporate image, reduced labour and operation costs, and enhanced competitive advantage). Finally, on the challenges of ICT adoption, the research considers how internal and external environmental factors, perceptions, and attitudes affect ICT adoption amongst SMEs in Ibadan, Nigeria.

Figure 2: Level of ICT Adoption Model

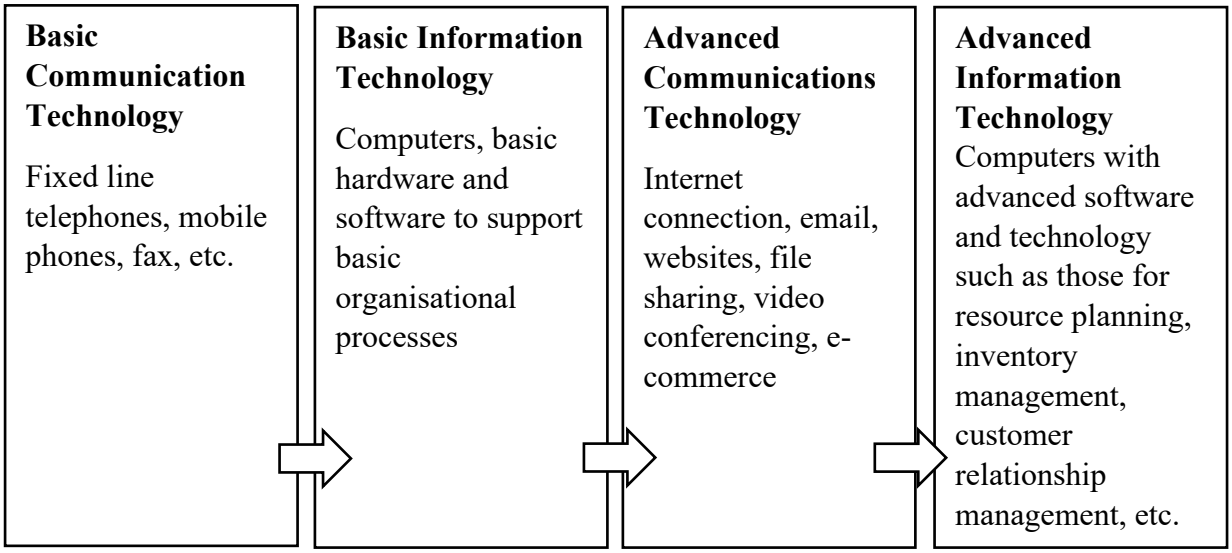


Figure 3: Drivers of ICT Adoption Model

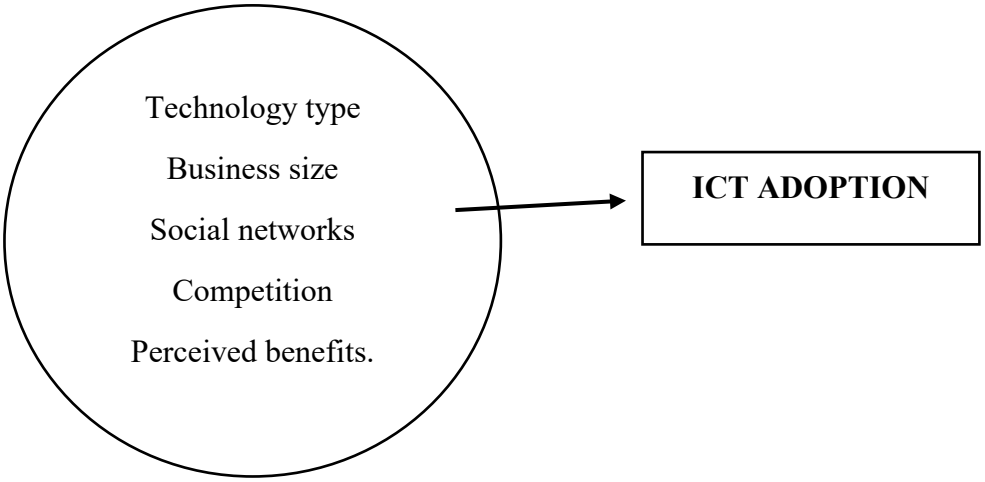
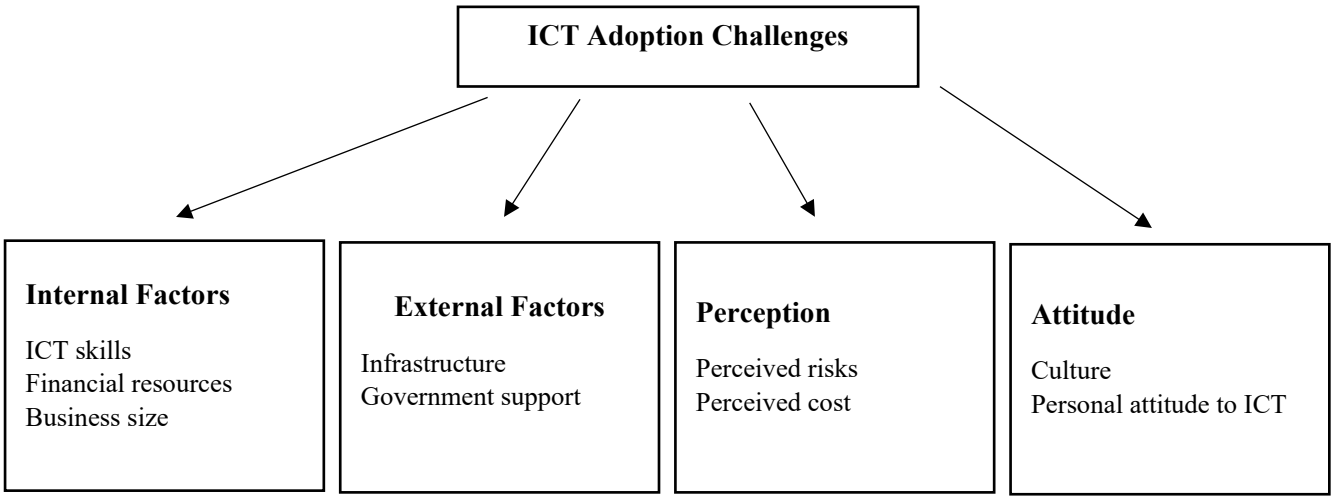


Figure 4: Challenges of ICT Adoption Model



CHAPTER THREE

3.0 RESEARCH METHODOLOGY

This section details the methods adopted for this research. It entails the research design and other information including the research population and sample frame, sample size and selection procedure, data types and sources, data collection instruments and methods, and method of data analysis.

3.1 Research Design

This study employs a combination of descriptive and inferential research design approaches involving quantitative and qualitative methods of data collection and analysis. This approach is suitable for the research due to the identified research problem and the subsequent research questions that the study intends to answer. It involves data collection through a structured research instrument to a predetermined sample population, in order to generate a better understanding of research variables.

Nonetheless, the proposed method is popular within studies in the same topic area. Some of these include studies conducted by Oyebiyi (2019); Apulu *et al*. (2013); Irefin *et al*. (2012) in Nigeria, Napitupulu *et al*. (2018), and Rahayu and Day (2017) in Indonesia, and Jahanshahi *et al*., (2013) in India, Malaysia, and Iran.

3.2 Research Population, Sample Frame and Sampling Procedure

The research population encompasses businesses that fall within the category of SMEs as defined by the Bank of Industry (2020). This means business organisations with an employee strength of less than 200, and a total asset and annual turnover of not more than ₦500 million. However, the unavailability of a database of SMEs in Nigeria is well documented (Oyebiyi, 2019; Irefin *et al*., 2012). Consequent to this, determining

a sample frame within which SMEs were selected for the research proved a little problematic.

However, the researcher was able to obtain a list of businesses in the study area from the Corporate Affairs Commission (CAC)—a national agency responsible for the regulation and management of business registration. From the list of businesses in Ibadan, 116 were identified in the SME category. However, a directory of address and contact information was available for only 92 of the businesses, with the rest marked as inactive.

For the sampling technique, the convenience sampling method was used. Although this method is a non-probabilistic sampling technique, it is suited to the study because it enabled the selection of respondents based on their ease of availability and willingness to participate. This became necessary as it was envisaged that some SMEs will decline to participate in the survey (Oyebiyi, 2019; Irefin *et al*., 2012).

3.3 Research Instrument

A structured questionnaire is employed as the research instrument (see Appendix 1). The questionnaire is close-ended and designed to have four sections covering the research questions. The first section entails the profile of the participating SMEs, with limited but structured response choices provided based on previous studies. Questions included in this section concerns the characteristics of each SME, such as nature of the organisation, the business sector, age of the organisation, number of employees and revenue base. These are what are applicable to similar studies conducted in Nigeria on the nature of SMEs (Oyebiyi, 2019; Agwu and Murray, 2015; Irefin *et al*., 2012).

Furthermore, the second section covers the level of ICT adoption. Four levels of ICT adoption are provided for SMEs to choose from. These levels are basic communication

(level 1), basic information technology (level 2), advanced communications technology (level 3), and advanced information technology (level 4). For this section, SMEs are expected to select a single option representing the stage of ICT adoption that they are, based on technologies they use on a day-to-day basis.

Moreover, the third section of the questionnaire focuses on factors that drive ICT adoption by SMEs. Factors that are considered in this section include the type of technology, business size, competition, social networks, and perceived benefits such as improved competitiveness, improved efficiency, extended market reach, increased sales, enhanced productivity and work effectiveness, enhanced company brand and corporate image, and reduced labour and operation costs. For this section, a 5-point Likert scale method was employed ranking each variable from "strongly disagree," to "strongly agree."

Finally, the last section of the questionnaire queried SME owners on their perception of challenges inhibiting ICT adoption. Factors queried comprises of internal, external, perception, and attitude factors, all of which are ranked on a 5-point Likert scale from "strongly disagree," to "strongly agree."

3.4 Pilot Survey and Data Reliability

A pilot survey was carried out with the research instrument prior to the actual data collection, and a reliability test was conducted on the results. This was done to ensure that the questions measure what they are intended to measure and that there is some level of internal consistency within the data. In order to do this, Cronbach's alpha (α) is used, as this was especially useful for the Likert scale components of the survey. The result of the reliability tests generated a Cronbach's alpha of .966 ($\alpha = .966$) which indicates a high level of internal consistency.

Reliability Statistics

Cronbach's	Cronbach's	N of Items
.966	.969	21

3.5 Data Collection

A review of existing literature revealed two major types of data collection methods, namely; electronic (online) collection and physical (in-person) collection, both with varying degrees of limitation and benefits. For this study, the online method of data collection is employed. This is made possible due to the availability of the contact information of the SMEs in Ibadan, namely their email address.

An electronic copy of the research questionnaire was developed and hosted on the Google Forms platform. A link to the online survey was generated and sent via email to the SME owners.

3.6 Data Analysis

The descriptive-analytical method is employed for this study. The results are summarized using basic statistical methods such as frequency tables, percentages, means, as well as charts. For accurate data collation and efficient data analysis, IBM Statistical Package for the Social Sciences (SPSS v. 25) software was employed by the researcher.

Furthermore, in order to test the research hypotheses towards answering the research question, some inferential statistical methods are employed. For example, to test the first research hypothesis, a Chi-square test for the association is considered as most appropriate. This allows for a comparison between the predictive variable (SMEs based on size) and the outcome variable (level of ICT adoption). In addition, a multivariate

analysis of variance (one-way MANOVA) is used for the second research hypothesis. This allows for the comparison of mean differences between the outcome variable (drivers of ICT adoption) and the predictive variable (SMEs on the basis of size). Similarly, a multivariate analysis of variance was employed to test the last hypothesis, in order to measure the relationship between perceived challenges of ICT adoption and the actual level of ICT adoption by SMEs in the study area.

3.7 Ethical Consideration

Although the basis for ethical consideration in research majorly concerns medical research involving human subjects, the principles are often applied to research in other fields as long as human subjects are involved. There are two major documents within which the principles of ethics in research are enshrined in. These are The Declaration of Helsinki (1964), and the Belmont Report (1979).

One of the fundamental principles of ethics in both documents is that people should have the right to make informed decisions about participating in research. Consequent to this, informed consent is used to ensure that potential participants have every information about the research to inform their participation or otherwise. Therefore, for this research, the research instrument provided clear and adequate information about the research purpose and objectives to SME owners in order to inform their decision to participate.

Furthermore, justice and fairness are other principles of ethics in research. Although the unavailability of a cohesive database of SMEs is a major challenge to this, the research ensured inclusiveness in the survey as much as possible. This was done by ensuring that cross-sections of SME owners are involved, and that participation is not restricted to anyone on the basis of any social construct.

Finally, the principles of confidentiality and privacy were completely upheld, as the data collection process ensured that the data provided by the respondents cannot be linked back to any specific individual or party. One of the ways this was achieved is that SME owners were not required to submit their email or any other contact information when responding to the online questionnaire. Finally, the data obtained was only used for the purpose with which the participants' consent was given.

3.8 Limitation of Study

There are a few limitations to this research brought about by some specific constraints. Firstly, the lack of a formal database of SMEs in Nigeria is a challenge to this research. The consequence of this is that some level of resourcefulness would have to be deployed in identifying the research population, and this in most cases does not translate to the ideal. In addition, previous studies have shown that some of the potential respondents would likely decline participation in the research (Oyebiyi, 2019; Irefin *et al*., 2012). Thus, the sample frame will be further depleted, limiting available SMEs to be selected for the survey. For example, because of the unavailability of a purpose-built and comprehensive SME database, the sample frame that will be adopted is not exhaustive. It is also not inclusive of businesses that are not registered with the CAC, thereby introducing some level of bias into the sample selection process.

In addition, Covid-19 restrictions and quarantine guidelines scuppered the plans to travel and conduct a physical (in-person) data collection, which is most ideal considering the high level of completion and return rate attributed to this method. Consequently, the study settled for the online method of data collection with its attendant challenges.

CHAPTER FOUR

4.0 DATA ANALYSIS AND INTERPRETATION

4.1 Introduction and Characteristics of SMEs in Ibadan Metropolis

This section covers the findings of the survey conducted to answer the questions that this study set out to answer. These questions are on the level of ICT adoption in Ibadan Metropolis, drivers and challenges of ICT adoption by the SMEs in the study area. From the 92 businesses that were chosen for the survey and contacted to fill the online form, only 53 responded, which amounts to a 58% response rate. However, due to time constraints, the response rate was deemed to be adequate. In addition, the sample size was found to be relatively higher than that of Rahayu and Day (2017), Agwu and Murray (2015) and Irefin et al. (2012).

The results of the survey are analysed with both descriptive and inferential statistical methods. The descriptive method includes the use of frequency and percentage tables, as well as mean and standard deviation. On the other hand, inferential statistics that was employed was used to test the hypotheses developed for the research questions. These comprise the Chi-Square test and the Multivariate analysis of variance (MANOVA).

The findings are presented thematically in the sections that follow, starting with the characteristics of SMEs in the study area. Each section is accompanied by a frequency table, and an explanation of the findings as presented in the table. The hypotheses are also presented in a similar fashion. Consequent to this, Table 3 shows the findings of the survey on the characteristics of the SMEs in the study area.

Table 3 – Characteristics of SMEs in Ibadan Metropolis

Nature of Business	**Frequency**	**Percentage**
Family business	3	5.7
Partnership	10	18.9
Private limited company	8	15.1
Public limited company	1	1.9
Sole proprietorship	31	58.5
Industrial Sector	**Frequency**	**Percentage**
Agro-allied	11	20.8
Building and construction	9	17.0
Events and entertainment	4	7.5
Manufacturing	7	13.2
Pharmaceuticals	3	5.7
Printing and Advertising	1	1.9
Trading	9	17.0
Others	9	17.0
Staff Strength	**Frequency**	**Percentage**
0-10	37	69.8
11-49	13	24.5
50-200	3	5.7
Business Age	**Frequency**	**Percentage**
0-5 years	24	45.3
6-10 years	24	45.3
> 10 years	5	9.4
Annual Turnover	**Frequency**	**Percentage**
< N20m	25	47.17
N20m-N99m	23	43.40
N100m and above	5	9.43
Total	**53**	**100.00**

Source: Author's field survey, 2021

Table 3 shows the background data obtained on SMEs in Ibadan. As shown in the table, it can be seen that the majority of the businesses are owned by a single person, accounting for 58% of the total. This is followed by partnerships (18%) and private

limited companies (15%). However, it is noteworthy that the survey captured a cross-section of business types. Similarly, a variety of industrial sectors are represented, including agro-allied, manufacturing, building and construction, pharmaceuticals, and trading.

However, as revealed by the staff strength of the SMEs, the majority (70%) are in the micro category, with only a few (6%) in the medium category as defined by the Nigerian Bank of Industry. This is also corroborated by the rate of the annual turnover of the businesses, with close to half of them earning less than ₦20 million annually. The size of a business is one of the factors that have been identified to influence the adoption of ICT by businesses in Nigeria (Nafiu *et al*., 2020). Finally, it is revealed that only few of the businesses have been in existence for longer than 10 years, indicating that majority of the businesses are relatively new. This is a worrying indicator that may suggest that the business environment in the country is not sustainable, therefore requiring innovative solutions in ensuring the sustainability of SMEs in the study area. With ICT adoption having been observed as one of such ways to make SMEs competitive, it thus becomes even more important to understand what factors drive its adoption, as well as those which currently hinders adoption in Ibadan Metropolis.

4.2 Analysis of Research Questions

4.2.1 Data Analysis and Findings on Level of ICT Adoption by SMEs in Ibadan Metropolis

Research Question 1

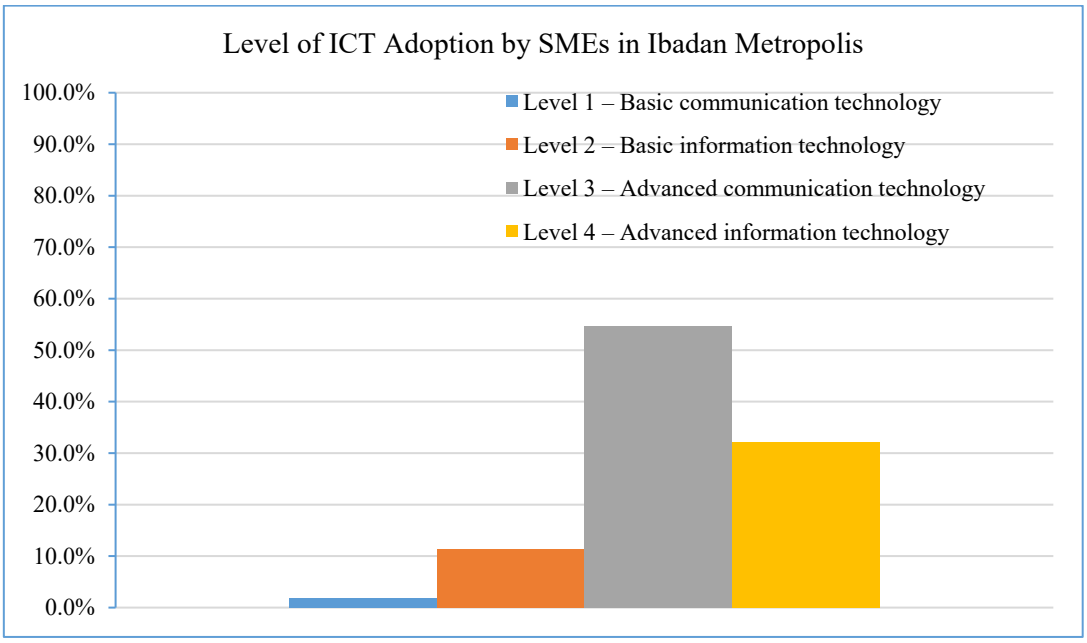
What is the level of ICT adoption of SMEs in Ibadan?

Table 4 – Level of ICT Adoption by SMEs in Ibadan Metropolis

Level of ICT Adoption	Frequency	Percentage
Level 1 – Basic communication technology	1	1.89
Level 2 – Basic information technology	6	11.32

Level 3 – Advanced communication technology	29	54.72
Level 4 – Advanced information technology	17	32.08
Total	**53**	**100.00**

Source: Author's field survey, 2021



From the survey data presented in Table 4, 54.7% of the SMEs in Ibadan Metropolis are presently at the third level of ICT adoption, which is the advanced communication technology level, involving the use of internet connection for email access, website, file sharing, and e-commerce. This is followed by 32% of them who stated that they are at level 4, which is the advanced information technology stage involving the use of sophisticated business software for activities like inventory planning and management, project planning and management, and financial planning and budget management. Furthermore, 11.3% of the SME owners have only adopted the basic information technology and 1.89% are only at the most basic level of ICT adoption, which is the use of mobile phones.

It can therefore be inferred from this information that the majority of the SMEs in Ibadan Metropolis have integrated ICT into the day-to-day activities of their

enterprises, although their level of adoption still varies. However, what is most notable is that there are presently non-adopters of ICT amongst the SMEs surveyed.

4.2.2 Data Analysis and Findings on Drivers of ICT Adoption by SMEs in Ibadan Metropolis

Research Question 2

What factors drive the adoption of ICT by SMEs in the study area?

Table 5 – Drivers of ICT Adoption by SMEs in Ibadan Metropolis

Factors of ICT Adoption	Mean	Std. Deviation	N	Rank
Type of Technology	4.04	1.037	53	8
Business Size	3.98	.909	53	
Competition	3.91	.925	53	
Social Networks	3.04	1.109	53	
Improved Competitiveness	4.09	.966	53	5
Improved Efficiency	4.09	.925	53	5
Extended Market Reach	4.51	.993	53	2
Increased Sales	4.42	1.027	53	3
Enhanced Productivity	4.06	.989	53	7
Work Effectiveness	3.91	.904	53	
Enhanced Company Brand and Corporate Image	4.55	.992	53	1
Reduced Labour and Operation Costs	3.17	1.139	53	
Reduced Marketing & Advertising Cost	3.11	1.219	53	
Improved Customer/Client Relationship	4.36	1.021	53	4
			Benchmark	

= 4.0

Source: Author's computations, 2021

Factors that drive the adoption and type of ICT adopted by SMEs range from the size of the business, type of technology available, to the perception of benefits accruable from ICT adoption by SME owners. In order to identify these factors as are applicable to businesses in Ibadan Metropolis, the SME owners were requested to rank 14 items

obtained from the review of existing literature using a 5-point Likert scaling system. Subsequently, the mean rank of each option is calculated and presented in Table 5.

As shown in the table, only eight of the 14 items provided achieved the benchmark score of 4.0. These represent the factors that drive ICT adoption by SMEs in Ibadan Metropolis as ranked by the SME owners. For example, "enhanced company brand and corporate image" with a mean score of 4.55 is the top-ranked driver of ICT adoption in the study area. This implies that the SME owners believe that adopting ICT will put their brands in a new light, thereby making them attractive to potential customers. Online presence as reflected by a corporate email address, website and social media presence will improve their corporate image and make them more competitive in their sector. This finding is similar to that of Jahanshahi *et al*., (2013) in their study of SMEs in India, Malaysia, and Iran.

Furthermore, "extended market reach" and "increased sales," are ranked 2nd and 3rd with mean scores of 4.51 and 4.42 respectively. These direct economic benefits are interrelated and very important to all businesses. ICT adoption through online presence by the way of website and social media, as well as target marketing also using email and the social media are great ways for a business to have a reach beyond their physical environment. It can therefore be inferred from this information that these possibilities of ICT are one of the major drivers of ICT adoption in Ibadan Metropolis.

In addition, "improved customer/client relationship (4.36)," "improved competitiveness (4.09)," and "improved efficiency (4.09)" make up the top 5 of biggest drivers of ICT adoption by SMEs in Ibadan Metropolis. Ideally, these are important objectives of businesses: to have a long-lasting rewarding relationship with their customers, to be able to compete effectively in their market and, to be efficient in their

daily business activities. However, the possibility of attaining these objectives from using ICT makes it attractive to SME owners. These factors were also found to significantly influence ICT adoption by SME owners in studies by Rahayu and Day (2017) in Indonesia and Lal (2007) in Nigeria. Other factors influencing ICT adoption by SMEs as ranked by SME owners in the study area are enhanced productivity (4.06) and type of technology (4.04).

However, "business size" (3.98), "work effectiveness" (3.91), "competition" (3.85), "reduced marketing and advertising cost" (3.11), "enhanced productivity" (3.06) and "social networks" (2.47) are the least ranked factors influencing ICT adoption by SMEs owners in Ibadan Metropolis. Although ICT adoption improves the competitiveness of businesses, the high cost of ICT infrastructure and internet access in Nigeria may be expensive for small business owners. The cost of advertising on different online platforms in order to reach a wider audience especially increases the cost of ICT adoption. As found by Okundaye *et al*. (2019) cost of implementing ICT is a major determinant of ICT adoption. This may therefore be a justification for the low rating for "reduced marketing and advertising cost" as a driver of ICT adoption.

Similarly, the type of ICT in use by SMEs in the study area may influence their opinion of "enhanced productivity" as a lesser factor of ICT adoption. The finding of this study on enhanced productivity as a factor of ICT adoption contradicts that of Rahayu and Day (2017) and Jahanshahi *et al*. (2013). Also, the finding on social networks is in disagreement with that of Aleke *et al*. (2011) in Nigeria.

4.2.3 Data Analysis and Findings on Challenges of ICT Adoption by SMEs in Ibadan Metropolis

Research Question 3

What are the challenges militating against ICT adoption by SMEs in the study area?

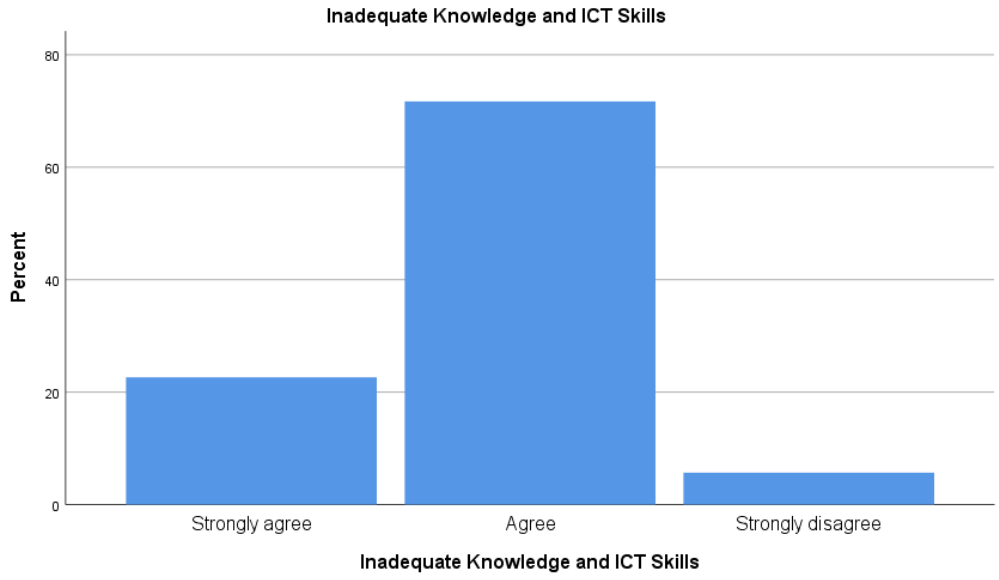
In order to determine which factors inhibit the adoption of ICT by SMEs in Ibadan Metropolis, the SME owners were requested to rank the factors according to their perception. They were presented with a 5-point Likert scaling system ranging from "strongly disagree" to "strongly agree." The result of the survey is presented in Table 6 as follows:

Table 6 – Inadequate Knowledge and ICT Skills

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	12	22.6	22.6	22.6
	Agree	38	71.7	71.7	94.3
	Strongly disagree	3	5.7	5.7	100.0
	Total	**53**	**100.0**	**100.0**	

Source: Author's computations, 2021

Figure 5 - Bar Chart showing SME owners' rating of Inadequate Knowledge and ICT Skills



Source: Chart generated from SPSS v. 25

As represented in Table 6, close to one-third (22.6%) of the SME owners strongly agreed with "inadequate knowledge and ICT skills" as a challenge of ICT adoption by SMEs in the study area. Similarly, the majority of them (71.7%) agreed with the factor as a challenge in the area. However, a few of them (5.7%) disagreed. It can thus be

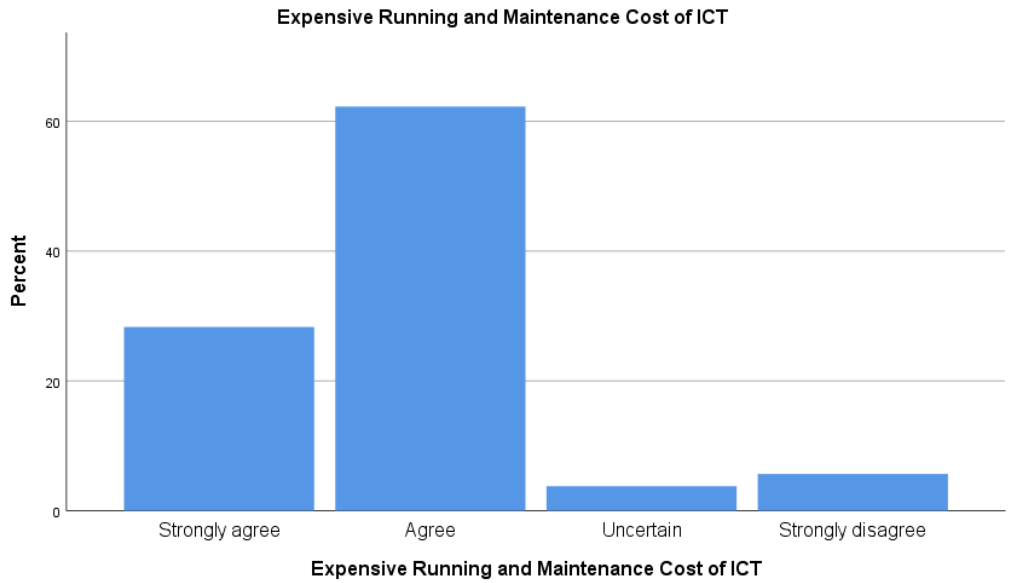
inferred from this information that the adoption of ICT by SME owners in Ibadan Metropolis is inhibited by their inadequate knowledge and skills of ICT. This is also clearly illustrated in figure 5 above.

Table 7 – Expensive Running and Maintenance Cost of ICT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	15	28.3	28.3	28.3
	Agree	33	62.3	62.3	90.6
	Uncertain	2	3.8	3.8	94.3
	Strongly disagree	3	5.7	5.7	100.0
	Total	**53**	**100.0**	**100.0**	

Source: Author's computations, 2021

Figure 6 - Bar Chart showing SME owners' rating of Expensive Running and Maintenance Cost of ICT



Source: Chart generated from SPSS v. 25

Table 7 shows how SME owners in Ibadan Metropolis rated "expensive running and maintenance cost of ICT" as a challenge of ICT adoption. From the table, it is shown that 28.3% of them strongly agreed, while 62.3% agreed with the factor as a challenge.

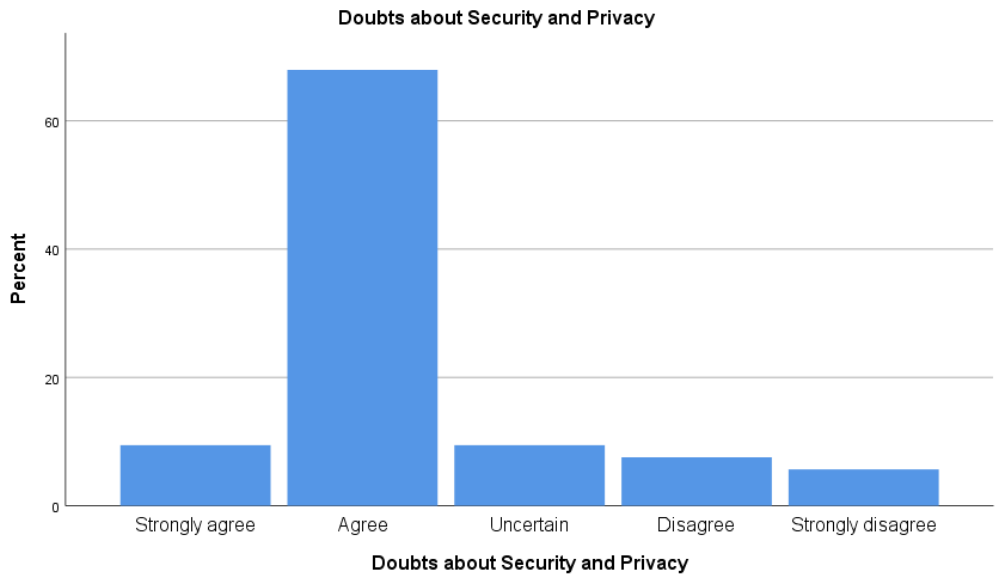
On the other hand, 5.7% of agreed with the factor, while 3.8% are uncertain as to how the factor inhibits adoption of ICT by SMEs in the area. It is therefore deduced from this information that the adoption of ICT by SME owners in Ibadan Metropolis is inhibited by the expensive running and maintenance cost of ICT. This trend is also clearly shown in figure 6 above.

Table 8 – Doubts about Security and Privacy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	5	9.4	9.4	9.4
	Agree	36	67.9	67.9	77.4
	Uncertain	5	9.4	9.4	86.8
	Disagree	4	7.5	7.5	94.3
	Strongly disagree	3	5.7	5.7	100.0
	Total	**53**	**100.0**	**100.0**	

Source: Author's computations, 2021

Figure 7 - Bar Chart showing SME owners' rating of Doubts about Security and Privacy



Source: Chart generated from SPSS v. 25

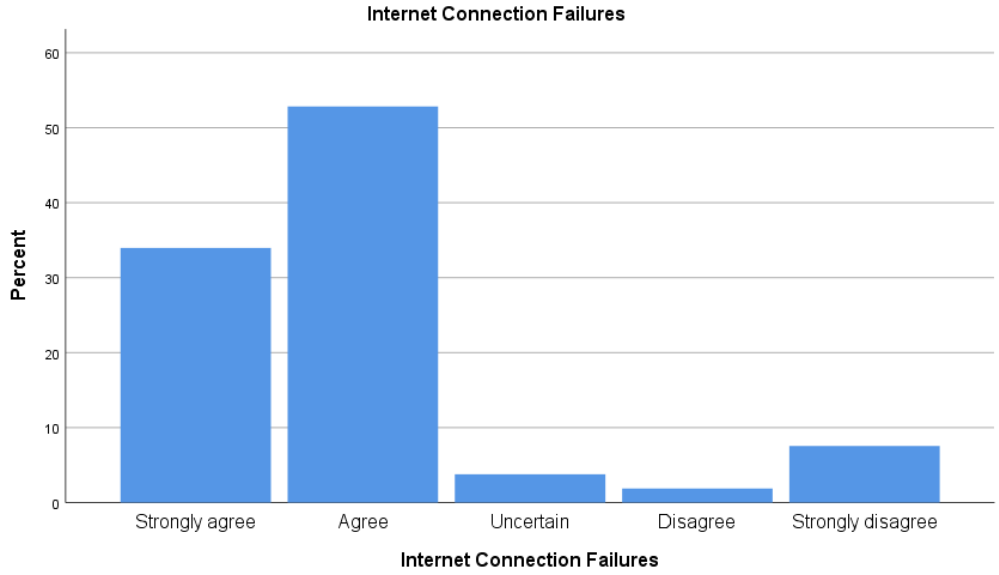
As shown in Table 8, 9.4% of the SME owners in Ibadan Metropolis strongly agreed that "doubts about security and privacy" is a challenge of ICT adoption. This is also corroborated by the majority (67.9%) who agreed with the factor as a challenge. However, 7.5% disagreed, while 5.7% strongly disagree with the factor inhibiting the adoption of ICT in the area. This information, therefore, suggests that the adoption of ICT by the majority of the SME owners in Ibadan Metropolis is limited by doubts about security and privacy. Figure 7 above also illustrates this information.

Table 9 – Internet Connection Failures

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	18	34.0	34.0	34.0
	Agree	28	52.8	52.8	86.8
	Uncertain	2	3.8	3.8	90.6
	Disagree	1	1.9	1.9	92.5
	Strongly disagree	4	7.5	7.5	100.0
	Total	**53**	**100.0**	**100.0**	

Source: Author's computations, 2021

Figure 8 - Bar Chart showing SME owners' rating of Internet Connection Failures



Source: Chart generated from SPSS v. 25

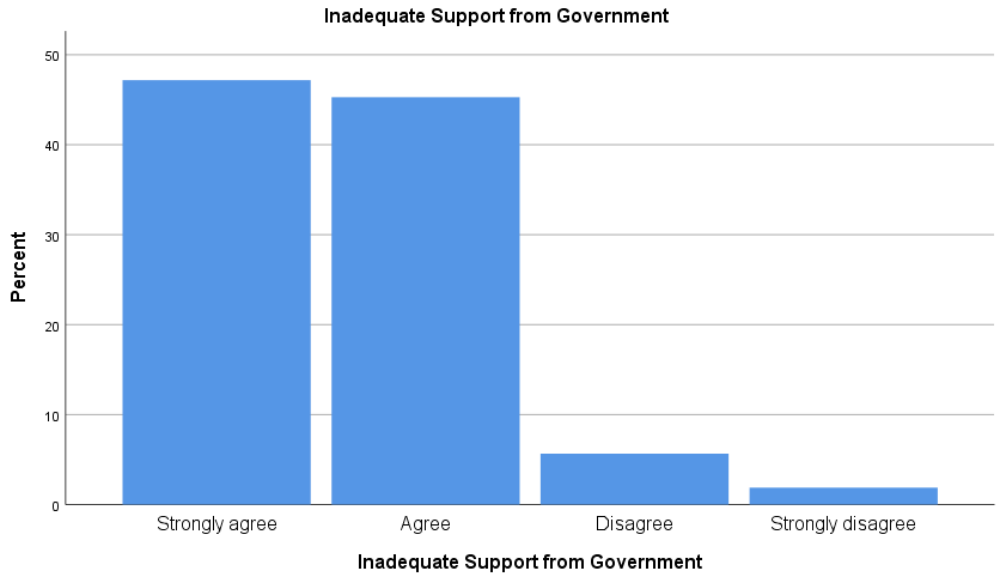
As shown in Table 9, more than one-third (34%) of the SME owners in Ibadan Metropolis strongly agreed that "internet connection failures" is a challenge of ICT adoption. Also, more than half (52.8%) agreed with the factor as a challenge. However, very few 1.9% disagreed, while 7.5% strongly disagree with the factor as hindering the adoption of ICT in the area. With this information, it can be construed that internet connection failure is a challenge to the adoption of ICT by SMEs in Ibadan Metropolis. This information is also supported by Figure 8 above.

Table 10 – Inadequate Support from Government

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	25	47.2	47.2	47.2
	Agree	24	45.3	45.3	92.5
	Disagree	3	5.7	5.7	98.1
	Strongly disagree	1	1.9	1.9	100.0
	Total	**53**	**100.0**	**100.0**	

Source: Author's computations, 2021

Figure 9 - Bar Chart showing SME owners' rating of Inadequate Support from Government



Source: Chart generated from SPSS v. 25

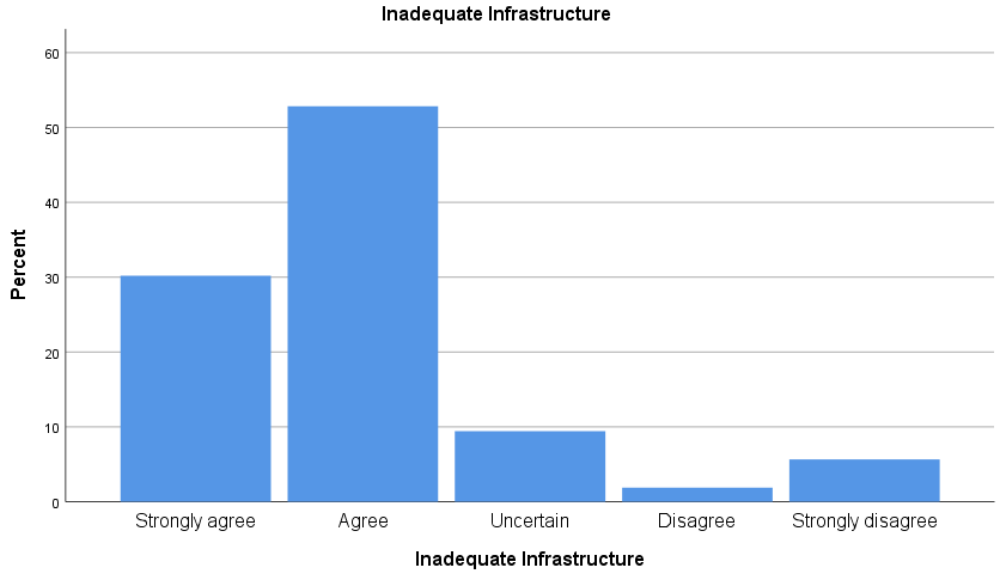
Table 10 shows that close to half (47.2%) of the SME owners in Ibadan Metropolis strongly agreed that "inadequate support from the government" is a challenge of ICT adoption in the area. In addition, 45.3% agreed that the factor is a challenge. However, a few (5.7%) of them disagree, and 1.9% strongly disagree with the factor as a challenge to the adoption of ICT in the area. As a result, it can be inferred from this information that inadequate support from the government is a challenge to the adoption of ICT by SMEs in Ibadan Metropolis. This information is also supported by Figure 9 above.

Table 11 – Inadequate Infrastructure

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	16	30.2	30.2	30.2
	Agree	28	52.8	52.8	83.0
	Uncertain	5	9.4	9.4	92.5
	Disagree	1	1.9	1.9	94.3
	Strongly disagree	3	5.7	5.7	100.0
	Total	**53**	**100.0**	**100.0**	

Source: Author's computations, 2021

Figure 10 - Bar Chart showing SME owners' rating of Inadequate Infrastructure



Source: Chart generated from SPSS v. 25

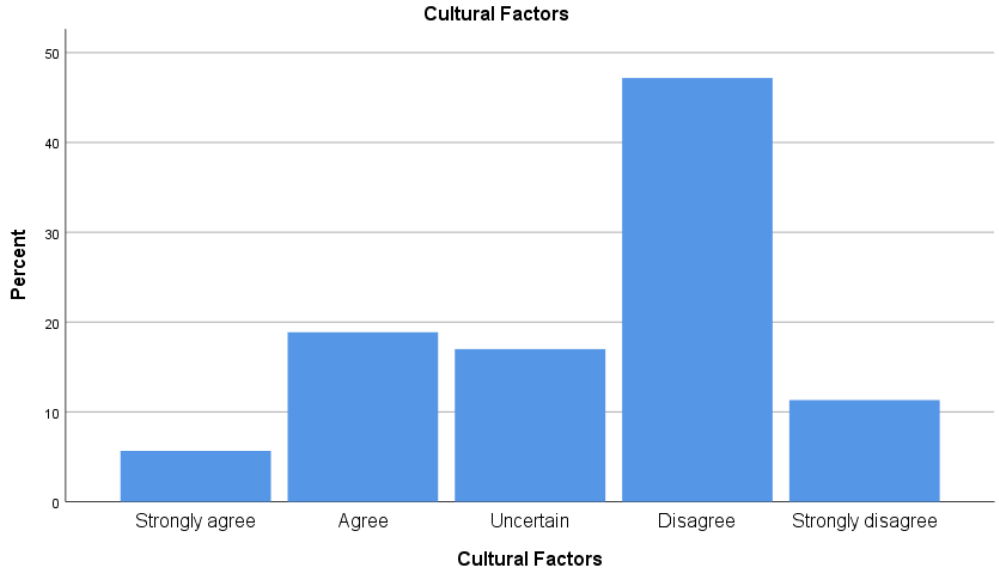
From Table 11, it can be seen that 30.2% of the SME owners in Ibadan Metropolis strongly agreed with "inadequate infrastructure" as a challenge of ICT adoption in the area. Additionally, over half of them (52.8%) corroborates this factor as a challenge. On contrary, 1.9% disagree, and 5.7% strongly disagree with the factor as a challenge to the adoption of ICT in the area. As a result, it can be inferred from this information that inadequate infrastructure is a challenge to the adoption of ICT by SMEs in Ibadan Metropolis. This information is also supported by Figure 10 above.

Table 12 – Cultural Factors

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	3	5.7	5.7	5.7
	Agree	10	18.9	18.9	24.5
	Uncertain	9	17.0	17.0	41.5
	Disagree	25	47.2	47.2	88.7
	Strongly disagree	6	11.3	11.3	100.0
	Total	**53**	**100.0**	**100.0**	

Source: Author's computations, 2021

Figure 11 - Bar Chart showing SME owners' rating of Cultural Factors



Source: Chart generated from SPSS v. 25

As shown in Table 12, only very few (5.7%) of the SME owners in Ibadan Metropolis strongly agree with "cultural factors" as a challenge of ICT adoption in the area. Additionally, 18.9% agree that the factor is a challenge. On contrary, a quarter (25%) of the SME owners disagree, and 11.3% strongly disagree that the factor is a challenge to the adoption of ICT in the area. Consequent to this information, it can be deduced from this information that cultural factors do not inhibit the adoption of ICT by SMEs in Ibadan Metropolis. Figure 11 above also clearly illustrates this information.

After the analysis of individual factors, the results were subsequently analysed to generate a mean rank of each factor. Also, a benchmark score of 4.0 was chosen in order to understand which factors actually inhibit the adoption of ICT as rated by the SME owners in the study area. The results are presented in Table 13 below:

Table 13 – Mean Ranking of ICT Adoption Challenges in Ibadan Metropolis

Challenges of ICT Adoption	Mean	Std. Deviation	N	Rank
Inadequate Knowledge and ICT Skills	4.06	0.864	53	3
Expensive Running and Maintenance Cost of ICT	4.08	0.917	53	2
Doubts about Security and Privacy	3.68	0.956	53	
Internet Connection Failures	4.04	1.073	53	4
Inadequate Support from Government	4.30	0.890	53	1
Inadequate Infrastructure	4.00	1.000	53	5
Cultural Factors	2.60	1.098	53	
		Benchmark = 4.0		

Source: Author's computations, 2021

From the table, it is seen that inadequate support from the government with a mean score of 4.3 is rated as the biggest challenge to their ICT adoption. This is followed by the expensive running and maintenance cost of ICT, ranked with a mean score of 4.08. The cost of running and maintaining ICT for SMEs can comprise the cost of investing

in ICT tools like computers and other paraphernalia, setting up and maintaining the connection to the internet, setting up a website to serve as an online catalogue or showroom for the business, running online advertisements to improve visibility, engaging social media experts and copywriters to drive online marketing campaigns, subscribing to industry-specific and purpose-built tools, and more. However, all of these may be overwhelming for small businesses to finance, even if they are familiar with the potential benefits of ICT integration. This supports initial findings by Agwu and Murray (2015) who found that the cost of investing in ICT far outweighs the profits of some of the businesses in Nigeria.

Inadequate knowledge of ICT and skill is another top challenge militating against effective ICT adoption in Ibadan Metropolis, with a mean score of 4.06 and ranking 3rd on the list. This is followed by internet connection failure (4.04) and inadequate infrastructure (4.0) as 4th and 5th respectively. Doubts about security and privacy and cultural factors are the two least-ranked factors, with mean scores of 3.68 and 2.6 respectively. This infers that SMEs in Ibadan Metropolis does not consider these two factors as critical challenges to their adoption of ICT for their businesses.

4.3 Hypotheses Testing

Three hypotheses have been stated for this research. In this section, appropriate statistical methods are deployed to either confirm or reject the statements. In order to accept the null hypothesis, the *p*-value obtained from a statistical test will have to be greater than 0.05, which would represent a 95% confidence level. Otherwise, if the *p*-value is lower than 0.05, the null hypothesis will be rejected. All statistical tests are conducted with the IBM SPSS Statistics software version 25.

4.3.1 Hypothesis 1

* H0: There is no significant relationship between the level of ICT adoption and size of SMEs in Ibadan Metropolis.

Table 14 – Chi-Square Test result for Hypothesis 1

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	20.621[a]	6	.002
Likelihood Ratio	21.572	6	.001
N of Valid Cases	53		

a. 9 cells (75.0%) have expected count less than 5. The minimum expected count is .06.

For hypothesis 1, a Chi-square test of association is used to compare the level of ICT adoption (the outcome variable) across different categories of SMEs (on the basis of size) in the study area. The result of the Chi-Square test is shown in table 14 above.

From the Chi-Square test results displayed in Table 14, we can see that χ (1) = 20.625, p = .002.

This thus means that the null hypothesis can be rejected, and as a result, we can deduce that there is a statistically significant relationship between the level of ICT adoption and the size of SMEs in Ibadan Metropolis. This means that the adoption of ICT by SMEs in the study area is influenced by the size of SMEs. This confirms earlier findings by Nafiu *et al*. (2020) and Lu *et al*. (2019)

4.3.2 Hypothesis 2

* H0: There are no significant differences in the perception of ICT adoption drivers amongst SMEs in Ibadan.

Table 15 – Multivariate Analysis result for Hypothesis 2

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.926	32.907[b]	14.000	37.000	.000	.926
	Wilks' Lambda	.074	32.907[b]	14.000	37.000	.000	.926
	Hotelling's Trace	12.451	32.907[b]	14.000	37.000	.000	.926
	Roy's Largest Root	12.451	32.907[b]	14.000	37.000	.000	.926
SMEs	Pillai's Trace	.512	.933	28.000	76.000	.568	.256
	Wilks' Lambda	.536	.966[b]	28.000	74.000	.525	.268
	Hotelling's Trace	.775	.996	28.000	72.000	.486	.279
	Roy's Largest Root	.634	1.721[c]	14.000	38.000	.092	.388

a. Design: Intercept + SMEs
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

In order to test the hypothesis, a multivariate analysis of variance is used. This helps to compare the means of multiple outcome variables (perceptions of ICT adoption drivers) against a predictor variable (SMEs categorised by size). The result of the multivariate analysis is shown in Table 15.

In order to interpret the result of the multivariate analysis of variance, the Wilks' Lambda row is considered. In multivariate analysis of variance, the Wilks' Lambda statistic (Λ) is used to test whether there are differences between the means of a group of subjects on a combination of outcome variables. It measures the proportion of variance in the outcome variables (drivers of ICT adoption) that is not as a result of the predictor variable (SMEs).

A value of 0 (i.e. Wilks' $\Lambda = 0$) means that there is no variance unaccounted for by the predictor variable, and the closest the value is to 0, the more likely it will be to reject the null hypothesis. Additionally, the Partial eta squared ($\eta 2$) shows how much variance in the outcome variable is explained by the predictor variable. The value ranges between 0 and 1, where values closer to 0 indicate a small effect.

From the result of the test in Table 15, it can be seen that there is no statistically significant difference in the perception of SME owners on the factors that influence ICT adoption in the study area F (28, 74) = .97, p = .525; Wilk's Λ = .536, partial $\eta 2$ = .27). Consequently, the null hypothesis is accepted, with this further reinforcing that the drivers of ICT adoption by SMEs in Ibadan Metropolis as rated by the SME owners are consistent across the different categories.

4.3.3 Hypothesis 3

* H0: There is no significant relationship between perception of challenges and level of ICT adoption of SMEs in Ibadan.

A multivariate analysis of variance was used to test the hypothesis. The result is presented in Table 16.

Table 16 – Multivariate Analysis result for Hypothesis 3

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.883	46.276[b]	7.000	43.000	.000	.883
	Wilks' Lambda	.117	46.276[b]	7.000	43.000	.000	.883
	Hotelling's Trace	7.533	46.276[b]	7.000	43.000	.000	.883
	Roy's Largest Root	7.533	46.276[b]	7.000	43.000	.000	.883
SMEs	Pillai's Trace	.520	1.348	21.000	135.000	.156	.173

	Wilks' Lambda	.542	1.405	21.000	124.023	.129	.185
	Hotelling's Trace	.733	1.454	21.000	125.000	.106	.196
	Roy's Largest Root	.531	3.413[c]	7.000	45.000	.005	.347

a. Design: Intercept + ICT_Adoption_Level
b. Exact statistic
c. The statistic is an upper bound on F that yields a lower bound on the significance level.

From the result of the test in the table above, it can be seen that there is no statistically significant difference in the perception of SME owners on the challenges of ICT adoption and level of ICT adoption in the study area ($F(21, 124) = 1.4$, $p = .129$; Wilk's $\Lambda = .542$, partial $\eta 2 = .185$). Consequently, the null hypothesis is accepted. It can thus be inferred from this information that there is no relationship between perceived challenges of ICT and level of ICT adoption in the study area.

4.4 Conclusion

This chapter has shown the results of the survey conducted in order to answer the research questions. The findings on the level of ICT adoption in the study area have shown that the majority of the SMEs have adopted an advanced level of ICT for their businesses. These included the use of advanced communications and information technology such as the internet connection, email, website, file sharing, as well as other advanced business software relevant to their business areas. The findings however revealed that the level of ICT adoption in the area depends significantly on the size of business in the area.

Furthermore, on the factors that influence the decisions of the SMEs to adopt and use ICT for their businesses, it was revealed that the benefits of ICT as perceived by SME owners are the major driver of their ICT adoption in the study area. Some of these factors include enhancement of company image and corporate brand, increased sales, improved customer relationship, and improved efficiency. In contrast, the SME owners

disagreed with options such as reduced marketing cost, type of technology, and business size as influencing their decision to adopt ICT. The findings of the research in this section were also found to be in alliance with several existing literature.

Finally, on the challenges of ICT adoption, as perceived by SME owners in the study area, it was discovered that inadequate support from the government is the biggest challenge inhibiting their level of ICT adoption. Other factors that are identified by the research include expensive running and maintenance cost of ICT, inadequate knowledge of ICT and skill, internet connection failure and inadequate infrastructure. On the other hand, it was revealed that doubts about security and privacy, as well as cultural factors, do not have an influence on ICT adoption by the SMEs in the study area.

CHAPTER FIVE

5.0 DISCUSSION OF FINDINGS

5.1 Introduction

Understanding the positive effects that Small and Medium Scale Enterprises (SMEs) have on the social and economic growth of countries of the world over, it has become highly imperative to give utmost attention to their growth and sustainability. Additionally, with the advent of ICT, SMEs globally have been integrating different technological tools and capabilities to enable their small businesses to be competitive and stand the test of time. However, as shown by the review of literature in the early parts of this research, SMEs in the developing world generally and Nigeria specifically have been slow to follow the trend. Several issues have been found by various researchers in their areas of study as affecting the rate and level of adoption of ICT by SMEs.

This foregoing formed the basis for this study, which set out to understand issues around the adoption of ICT for SMEs in Ibadan, Nigeria. Specifically, the study investigated the level of ICT adoption by the SMEs in the area, the factors that drive their adoption, as well as the challenges inhibiting the adoption of ICT by the SMEs. Consequently, this section presents a discussion of the findings of this study on each research question in the wider scope of relevant extant literature. It provides deeper insight into what the findings actually mean in comparison to previous studies in the topic area, as well as how they fit with established theories on the subject matter.

5.2 Level of ICT Adoption by SMEs in Ibadan Metropolis

A review of the literature revealed four stages of ICT adoption through which SMEs progress from the basic level to the advanced level of adoption (Kotelnikov, 2007).

These are basic communications technology, basic information technology, advanced communications technology, and advanced information technology. Progression from a basic stage to an advanced stage requires advanced technology and increased investment.

According to the feedback from the survey respondents of this study, it was discovered that the majority of the SMEs in Ibadan Metropolis are presently at an advanced level of ICT adoption. Some of them stated that they use the internet regularly for email communication, website, file sharing, and also e-commerce. In the same vein, others stated that they use some sophisticated and business-specific software for activities like inventory planning and management, project planning and management, and financial planning and budget management. In this regard, the findings revealed a disagreement with popular notions that SMEs in developing countries are still at an early stage in their adoption of ICT. This could however be as a result of the online method of data collection employed for the survey, as it meant that only those who are already familiar with technology were investigated for the research.

On the other hand, the survey also found out that few of the SMEs are still at the basic level of ICT adoption. Some of these only use computers without an internet connection for documents that are printed out on paper and distributed manually, while others only use mobile phones to keep in touch with clients and suppliers. This is similar to the previous findings in other cities in Nigeria (Nafiu *et al*., 2020; Oyebiyi, 2019 and Afolabi *et al*., 2015).

Furthermore, the hypotheses developed on ICT adoption by the SMEs in the study are intended to confirm previous assertions of the role played by the size of business as a factor of ICT adoption. A Chi-square test of association is used to compare the level of

ICT adoption (the outcome variable) across different categories of SMEs (on the basis of size) in the study area. Subsequently, the result revealed that ICT adoption in the study area is significantly affected by the size of the SMEs as measured with staff strength. This could imply that the level at which SMEs in the study area adopts ICT for their businesses is closely related to how much personnel the organisation has, which when higher is indicative of growth, which in itself signifies the level of influence, production rate and capacity, as well as the customer base that an organisation has. Consequently, an organisation with a large production rate and customer base might feel the need to improve on internal efficiency level, sustain its influence, and maintain a smooth relationship with the customer base.

This finding is consistent with earlier findings conducted by different researchers in Nigeria and China. For example, the findings of Nafiu *et al* (2020) in Kogi State, Nigeria had revealed that small businesses do not feel the need for adopting ICT as much as medium businesses. Also, the researchers found that medium businesses found it easier to use ICT than small businesses. Similarly, Lu *et al*. (2019) in their study conducted in China found that ICT adoption levels varied amongst micro, small and medium businesses. They observed that the level of ICT adoption was much higher amongst medium enterprises than the micro and small businesses in the study area.

The implication of this finding is multidimensional. On the one hand, ICT skill and technological know-how may be limited amongst owners of micro and small businesses, with this influencing the ease of use of ICT. On the other hand, due to their relatively small influence and customer base, they may also have the less financial capability to drive their ICT adoption. The limited financial resources can hinder their adoption level because they would be unable to afford the expensive cost of relevant hardware, software and internet connection, and outsourcing their ICT needs may also

prove difficult. This, therefore, indicates that these small businesses need to be the focus of interventions by relevant policymakers and government agencies.

Conclusively, the investigation on the level of ICT adoption by SMEs in Ibadan have revealed that the majority of the business owners in the area are up-to-date on the importance of ICT to the competitiveness of their businesses, and are willing to adopt it if not inhibited by challenges. However, it was also discovered that a few of the SMEs are still at the basic adoption stage, and that size is a major factor of ICT adoption in the area. Nevertheless, if the rate and level of ICT adoption by the SMEs in Ibadan Metropolis is to improve so as to effectively contribute to the development of the country at large, utmost attention is required, with a focus on the micro and small businesses in the area.

5.3 Drivers of ICT Adoption by SMEs in Ibadan Metropolis

The factors that affect ICT adoption can be subdivided into two, comprising those that support ICT adoption and those that inhibit adoption. It is imperative to understand these factors for a lot of reasons. One of such reasons is to catalyse those positive factors in other to improve the rate and level of adoption by SMEs. However, because those factors themselves may be influenced by demography, geography and economy, it is important to identify which ones are relevant to SMEs in Ibadan Metropolis.

In determining the factors that drive ICT adoption amongst SMEs in Ibadan Metropolis, it was discovered that the perceived benefits of ICT adoption are the top-ranked factors by the SME owners. For instance, “enhanced company brand and corporate image” is the top-ranked driver of ICT adoption in the study area. This implies that the SME owners believe that adopting ICT will put their brands in a new light, thereby making them attractive to potential customers. Online presence as reflected by a corporate email

address, website and social media presence will improve their corporate image and make them more competitive in their sector. Additionally, "extended market reach" and "increased sales," make up the top-three-ranked drivers of ICT adoption. These direct economic benefits are interrelated and very important to all businesses. ICT adoption through online presence by the way of website and social media, as well as target marketing also using email and the social media are great ways for businesses to have a reach beyond their physical environment. It can therefore be inferred from this information that these possibilities of ICT are the major drivers of ICT adoption by SMEs in Ibadan Metropolis. This finding is similar to that of Jahanshahi *et al*., (2013) in their study of SMEs in India, Malaysia, and Iran.

Furthermore, improved customer/client relationship, improved competitiveness, and improved efficiency complete the most significant drivers of ICT adoption as rated by the SME owners in Ibadan Metropolis. According to the SME owners, these are important benefits accruable from ICT adoption as they closely align with the objectives of most businesses. This finding supports previous findings by Rahayu and Day (2017) in Indonesia and Lal (2007) in Nigeria. Similarly, the findings of Tob-Ogu, *et al* (2018) revealed that the most important drivers of ICT adoption by business owners include various benefits that they perceive from the use of ICT.

Furthermore, competition and reduced marketing and advertising cost are some of the least-ranked factors by the SME owners. This may be affected by the high cost of ICT infrastructure and internet access in Nigeria, which is too expensive for small business owners. As a result, even if competition could be a likely motivation to adopt ICT, the prohibitive financial implication may be a demotivator. Similarly, the cost of advertising on different online platforms in order to reach a wider audience especially increases the cost of ICT adoption. As found by Okundaye *et al*. (2019) the cost of

implementing ICT is a major determinant of ICT adoption, which may therefore be a justification for the low rating of the two factors as influencers of ICT adoption in the study area.

Finally, the SME owners strongly disagreed with social networks as a driver of ICT adoption in the study area. Earlier, Aleke *et al* (2011) had found that a strong social relationship amongst entrepreneurs in Southern Nigeria contributed to their use of ICT. However, the finding of this study disagrees with that finding, suggesting that there is no such relationship amongst the SME owners in the study area.

The hypothesis tested for the research question further emphasises the response of the SME owners in Ibadan Metropolis on factors that influence their adoption of ICT. A multivariate analysis of variance test revealed that the perceptions of the SME owners are the same across the different categories of SME by size. This means that there are no differences in the findings of the survey amongst the micro, small and medium businesses in the area. It is therefore concluded that the benefits that are visible from ICT adoption are the major reasons why SMEs in Ibadan use ICT for their businesses.

5.4 Challenges of ICT Adoption by SMEs in Ibadan Metropolis

On the aspect of challenges militating against the adoption of ICT by businesses in Ibadan, it was discovered that inadequate support from the government is the biggest challenge inhibiting ICT adoption by the SME owners in the area. Lack of support from the government to SMEs is a significant challenge to the growth and development of small businesses in Nigeria. For these small businesses to compete with larger enterprises, they often require support in terms of financing, infrastructure, training, and enabling policies. However, this has usually not been the case, as it supports previous findings by Okundaye *et al*. (2019) and Irefin *et al*. (2012).

Other challenges of ICT adoption as perceived by SME owners in Ibadan includes expensive running and maintenance cost of ICT, inadequate knowledge of ICT and skill, internet connection failure and inadequate infrastructure. The cost of investing in ICT in Nigeria has been established to be beyond the reach of most businesses, and this can eventually break them if they cannot compete with larger businesses (Oyebiyi, 2019; Agwu and Murray, 2015). Similarly, several business owners do not have the requisite skill to appropriately adopt ICT. As a result, those who understand the benefit accruable from the adoption will either seek to establish an ICT unit and employ skilled staff or engage freelance personnel. Most small businesses will find this beyond their means and would rather remain at a basic adoption level which they can manage by themselves. Also, poor and erratic internet connection in Nigeria poses a challenge to ICT adoption by SMEs. Frequent unexpected internet downtime can frustrate the ability of businesses that require being online in real-time to stay competitive. Finally, the poor state of infrastructure in the country is highly notable as a significant inhibitor to business growth. However, those that seem to affect ICT adoption are epileptic power supply and poor communications infrastructure. These findings corroborate previous findings by Afolayan *et al*. (2015), Agwu and Murray (2015), Apulu *et al*. (2013), and Irefin *et al*. (2012).

However, the findings of this study revealed that doubts about security and privacy and cultural factors do not inhibit ICT adoption by SMEs in the study area. The findings on security and privacy as a challenge of ICT adoption contradicts that of Afolayan *et al*. (2015), while that on cultural factors not affecting ICT adoption by SMEs supports the findings of Okundaye *et al*. (2019).

5.5 Conclusion

The study had set out to understand ICT adoption issues in Ibadan Metropolis in order to ascertain the application to established findings in the extant literature on the subject matter. One of these findings is that SMEs in developed nations are slow to adopt ICT in comparison to their counterparts in the developed world. Some of these findings were established in countries such as Oman, Indonesia, Malaysia, and different cities in Nigeria. It was to this end that the first research question this study was set out to answer centred on the level and rate of ICT adoption in the study area. This study however found a slightly divergent result, showing that a significant proportion of the SMEs has adopted advanced types of ICT for their businesses. On the other hand, it was also revealed that ICT adoption is significantly dependent on the size of the enterprises, thereby corroborating several existing findings in that regard.

Furthermore, the study set out to identify the factors that influence the decisions of SMEs to adopt and use ICT for their businesses. In this regard, the survey revealed that the benefits of ICT as perceived by SME owners are the major factor of influence in their decision to use ICT. Some of these benefits as chosen by the SME owners include enhancement of company image and corporate brand, increased sales, improved customer relationship, and improved efficiency. In contrast, the SME owners disagreed with options such as reduced marketing cost, type of technology, and business size as influencing their decision to adopt ICT. The findings of the research in this section were also found to be in alliance with several existing literature.

Finally, on the challenges of ICT adoption, as perceived by SME owners in the study area, it was discovered that inadequate support from the government is the biggest challenge inhibiting their level of ICT adoption. Other factors that are identified by the research include expensive running and maintenance cost of ICT, inadequate

knowledge of ICT and skill, internet connection failure and inadequate infrastructure. On the other hand, it was revealed that doubts about security and privacy, as well as cultural factors, do not have an influence on ICT adoption by the SMEs in the study area.

This research has been able to contribute to the existing body of literature on issues of ICT adoption by SMEs in developing countries, providing additional insight into the issues of ICT adoption by SMEs in a developing country like Nigeria. It is believed that the findings of this research work will provide guidance to the appropriate entities in helping achieve a higher ICT diffusion rate and sustainability in the study area specifically and the country in general.

CHAPTER SIX

6.0 SUMMARY OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

The contributions of SMEs to social and economic growth cannot be overemphasised. In most countries, they are the highest employers of labour, employing over 90% of the total workforce. Also, they are responsible for a diverse range of products and services and are a major source of creativity and innovation. However, oftentimes, these SMEs are at risk of collapse, due to their inability to effectively compete with large firms in their sector. The advent of ICT and its incorporation into daily workflows have however strengthened the capacity of most SMEs in developed countries to be competitive. On contrary, SMEs in developing countries like Nigeria still struggle to compete, with research revealing that these SMEs are lagging in adopting ICT for their businesses.

Therefore, this research set out to understand issues of ICT adoption by SMEs in Ibadan Metropolis — one of the important economic cities of Nigeria. In order to do this, the study selected 92 enterprises in the small and medium scale category to investigate their level of ICT adoption, as well as gauge their perception of factors that influence and inhibit the adoption of ICT for their businesses. However, although only 53 of these businesses responded to the survey, the study has provided a useful insight into the ICT adoption situation of SMEs in the study area. Having also detailed this in the previous section, a summary of the research findings is presented in the next section.

6.2 Summary of Findings

On the level of ICT adoption by SMEs in Ibadan Metropolis, it was found that although the level of adoption varies, the SMEs in the study area are in one level of adoption or the other. Specifically, it has been discovered that most SMEs are in the ICT adoption

stage where they use email, website, e-commerce and file-sharing capabilities for their businesses. However, it was also discovered that a few of the SMEs are still at a basic level of ICT adoption, with some who are yet to take their businesses online besides the use of mobile phones, computers without internet connection, printers and photocopiers. The findings in the study area corroborate previous findings such as that of Nafiu *et al*. (2020), Oyebiyi (2019), and Afolabi *et al*. (2015) in other cities in Nigeria.

The research has revealed that the benefits of ICT as perceived by SME owners largely influence their decision to use ICT. Some of these benefits as chosen by the SME owners include enhancement of company image and corporate brand, increased sales, improved customer relationship, and improved efficiency. In contrast, the SME owners disagreed with options such as reduced marketing cost, type of technology, and business size as factors influencing their decision to adopt ICT. The findings of the research in this section were found to be in alliance with that by Rahayu and Day (2017), Jahanshahi *et al*., (2013), and Lal (2007).

On challenges of ICT adoption as perceived by SME owners in the study area, it was discovered that inadequate support from the government is the biggest challenge inhibiting their level of ICT adoption. Other factors that are identified by the research include expensive running and maintenance cost of ICT, inadequate knowledge of ICT and skill, internet connection failure and inadequate infrastructure. On the other hand, it was revealed that doubts about security and privacy, as well as cultural factors, do not have an influence on ICT adoption by the SMEs in the study area.

6.3 Contribution to Research Area and Implications

This research has been able to contribute to the existing body of literature on issues of ICT adoption by SMEs in developing countries. Due to the important role played by SMEs in the growth and development of countries all over the world, SMEs have become a strong topical issue of discussion amongst several researchers all over the world. This is most notable amongst researchers in developing countries with the aim of providing an empirical insight into the SME situation in their respective countries. Toeing this same line, this study has now contributed to a growing body of literature in that regard. Consequently, the implication of this is that the study provides additional insight into ICT adoption by SMEs in developing countries.

In another dimension, this research has now provided a reliable up-to-date insight into the situation of SMEs in Nigeria, specifically around their rate and level of ICT adoption. This becomes even more important considering that a large body of existing research on SMEs and their adoption of ICT has been in other cities like Lagos and Abuja. This study, therefore, contributes to the body of knowledge available in the country for relevant entities to use in designing a more robust and effective policy for the growth of SMEs and ensure the socio-economic sustainability of the country as a whole.

6.4 Recommendations

The level of ICT adoption by SMEs in the study area is indicative of the level of attention that still needs to be given to SMEs in Nigeria if their contribution to national development is to be upscaled. Although the study showed a relatively impressive rate of adoption, it should be noted that some aspects of the sample selection and data collection may be responsible for this, which would mean that the result in this regard may not be completely suggestive of a high rate of adoption of ICT by SMEs in the

area. Regardless, the research still revealed that some SMEs are still slow in adopting ICT.

Furthermore, challenges identified as militating against smooth ICT adoption by the SMEs suggest that the government of Nigeria still needs to recognise the significance of SMEs to economic growth and as a result, commit to empowering them by creating a conducive environment for businesses to thrive. For example, the issue of infrastructure needs to be addressed. When infrastructure like power and communications is in place and, in good condition, then innovation is encouraged in young Nigerians to establish enterprises that can compete effectively while existing businesses continue to thrive. Similarly, the government may need to clamp down on internet service providers to improve on their service delivery as a simultaneous effort to their infrastructure delivery commitment.

Furthermore, the government may need to request the assistance of external entities such as international development partners to assist in areas of providing support to small businesses in the country. This support can include building the capacity of small business owners on present digital skills, and awareness on emerging and possible future direction of ICT for businesses.

In addition to this, national bodies established to provide oversight to SMEs like the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) and the Bank of Industry (BOI) can create awareness campaigns on print and social media to improve the knowledge of small business owners on the benefits of adopting ICT for their businesses. Similarly, incentives can be provided to encourage ICT adoption by businesses across the country.

6.5 Limitations

Even though the study has provided an interesting insight into issues of ICT adoption by SMEs in Ibadan, Nigeria, there are few limitations that may affect the findings one way or the other. The first of these is the difficulty in reaching a wider scale of businesses. One contributor to this is the unavailability of a directory of SMEs in the country. This, therefore, meant that only 92 businesses could be contacted for the survey. Additionally, the inability to conduct an in-person data collection meant that only about a 58% response rate could be achieved. As a result, this is likely to affect generalising the findings of the research.

Another consequence of the online data collection method is that there is always a high tendency of the respondents to be ICT users. This is possibly why the survey captured a high rate of ICT adopters and no non-adopter of ICT amongst the SMEs in the study area. The email address of the SMEs as obtained from the Corporate Affairs Commission provided the basis of communication with the SMEs. At the minimum, this meant that the survey would capture a high rate of SMEs who are email users, which is the eventual reality of the research. Therefore, it is important to generalise the results of the study with caution.

6.6 Further Research

With the limitations of this research, the researcher will suggest that similar research is carried out in the study area but with a different method of sample selection, as well as the in-person method of data collection. This will provide a comparison with the findings of this research and will improve the generalisability of the research. Nevertheless, the following are other areas that future studies could consider:

1. Analysis of business performance and ICT adoption amongst SMEs in Ibadan, Nigeria.

2. Factors of ICT adoption amongst SMEs in the manufacturing sector of Ibadan, Nigeria.
3. A comparative analysis of rate and level of ICT adoption amongst SMEs in Lagos and Ibadan, Nigeria.

6.7 Conclusion

Evidence from extant literature has shown that SMEs play a vital role in the social and economic development of different countries of the world, thereby signifying their importance to social and economic stability as the highest employers of labour and a major contributor to GDP. However, evidence has also shown that the SMEs in developing countries are lagging, a situation that has been linked majorly to their ICT adoption level. The integration of ICT into business processes has shown that small businesses can begin to bridge the gap between themselves and large enterprises and become highly competitive both locally and internationally. However, findings have shown that SMEs in developing countries are lagging in adopting ICT, militated by several challenges.

It was the foregoing that informed this research work, which was conducted in Ibadan Metropolis, a city in Nigeria. This study found that a significant proportion of the SMEs are in the advanced stage of ICT adoption, with this significantly influenced by the size of the enterprises, thereby corroborating several existing findings in that regard. Additionally, it was discovered that the benefits of ICT as perceived by the SME owners are the major factor of influence in their decision to use ICT, while inadequate support from the government is the biggest challenge inhibiting their level of ICT adoption. Besides the government factor, the research identified the prohibitive cost of ICT adoption and maintenance, inadequate knowledge of ICT and skill, internet connection failure and inadequate infrastructure as other challenges in the study area.

Consequent to the findings, the study recommended that the government of Nigeria considers the importance of SMEs to economic development and pay attention to the needs of sustaining small businesses in the country. Most importantly, it was recommended that the government seeks to provide a conducive environment for businesses to thrive by the way of developing critical infrastructures such as power and communications technology. Also, it was recommended that the regulation of internet service providers be improved upon in order to improve their service delivery.

Finally, the research has been able to contribute to the existing body of literature on issues of ICT adoption by SMEs in developing countries, providing additional insight into the issues of ICT adoption by SMEs in Nigeria. It is believed that the findings of this research work will provide guidance to the appropriate entities in helping achieve an even higher ICT diffusion rate and sustainability in the study area specifically, and the country in general.

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APPENDIX 1

- *Research Survey administered to the business owner*

Section 1: Profile of SMEs in Ibadan Metropolis

Instruction: tick a single appropriate response

1) Which of the following categories does your organisation fall in? (a) family business [ ] (b) sole proprietorship [ ] (c) partnership [ ] (d) public limited company [ ] (e) private limited company [ ]
2) Which of the following is your company specialised in? (a) manufacturing [ ] (b) building and construction [ ] (c) trading [ ] (d) agro-allied [ ] (e) events and entertainment [ ] (f) printing [ ] (g) pharmaceuticals [ ] (h) others (please specify _____
3) How long has your organisation been in existence? (a) 0-5 years [ ] (b) 6-10 years [ ] (c) > 10 years [ ]
4) What is your organisation staff strength? (a) 0-10 [ ] (b) 11-49 [ ] (c) 50-200 [ ] (d) > 200 [ ]
5) What is the range of your annual turnover? (a) < N20m [ ] (b) N20m-N99m [ ] (c) N100m and above [ ]

Section 2: Levels of ICT Adoption by SMEs in Ibadan Metropolis

Instruction: please, select a single response based on the most advanced technology your business uses

A. Level 1 – land lines/mobiles phones
B. Level 2 – computers, printers, photocopiers
C. Level 3 – internet connection, email, website, file sharing, and e-commerce
D. Level 4 – advanced software for ease of organisation processes such as enterprise resource planning, inventory management, project planning and management, customer engagement, financial planning and budget management system, etc.

Section 3: Drivers of ICT Adoption by SMEs in Ibadan Metropolis

Instruction: please, rank based on your perception

Which factors drive your desire to adopt the type of ICT your company uses?

S/N	Drivers of ICT Adoption	Strongly disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly agree (5)
1	type of technology					
2	business size					
3	competition					
4	social networks					
5	improved competitiveness					
6	improved efficiency					
7	extended market reach					
8	increased sales					
9	enhanced productivity					
10	work effectiveness					
11	enhanced company					
12	brand and corporate image					
13	reduced labour and operation costs					
14	Reduced marketing & advertising cost					
15	Improved customer/client relationship					

Section 4: Perceived Challenges of ICT Adoption by SMEs in Ibadan Metropolis

Instruction: please, rank based on your perception

In your opinion, which of the following factors affect the effective adoption of ICT by businesses in Ibadan?

S/N	Challenges of ICT Adoption	Strongly disagree (1)	Disagree (2)	Uncertain (3)	Agree (4)	Strongly agree (5)
1	Inadequate knowledge and ICT skills					
2	Expensive running and maintenance cost of ICT					

3	Doubts about security and privacy					
4	Internet connection failures					
5	Inadequate support from government					
6	Inadequate infrastructure					
7	Cultural factors					

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.961	.964	14