

**IMPACT OF DIGITAL TECHNOLOGIES ON SMALL AND MEDIUM ENTERPRISES IN
EMERGING TOWNS: A CASE STUDY OF VHEMBE DISTRICT MUNICIPALITY**

by

MUTOBVU MPHO RONALD

(Student ID: 11606661)

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Supervisor: Dr. W. Munyoka

Co-Supervisor: Prof. A. Kadyamatimba

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DECLARATION

I, Mutobvu Mpho Ronald (11606661) hereby declare that this research project for Master of Commerce (MCOM) submitted to the Department of Business Information System at the University of Venda has not been submitted previously for any degree at this or any another university. It is original in design and execution, and all reference material contained therein has been duly acknowledged.

Student



Date 22 /06 /2020

ABSTRACT

The importance of digital technologies on the growth and sustainability of small, micro and medium-sized enterprises (SMMEs) across the world need not be reemphasised. SMMEs play a paramount role in the growth of economies, Gross Domestic Product (GDP) and the general socio-wellbeing of citizens; hence they are the driving force for employment creation. However, their efforts in adopting digital technologies to achieve their targets and growth, is not without challenges. This study establishes the impact of digital technologies on SMMEs in emerging towns in South Africa, with a focus on the Vhembe District Municipality in Limpopo Province. Guided by the Technology Organisation Environment (TOE) framework as a theoretical approach, this study proposed and tested a framework to predict factors that are impacting SMMEs. Data for testing the proposed framework was collected from 100 SMMEs owners and workers using a survey questionnaire across the Vhembe District Municipality. IBM SPSS was used to analyse the collected data using descriptive statistics and regression analysis. This study found that SMMEs with access to digital technologies have more access to information, markets, reduce operational costs while increasing the productivity and revenue. Management support regarding the use of digital technologies significantly improves the overall performance of SMMEs. This study recommends that government should provide an enabling environment through supportive policies and resources to ensure effective fusion and adoption of digital technologies by SMMEs.

Keyword: *Impact, Digital Technologies, SMMEs, Technology Acceptance Model, Emerging Towns, South Africa.*

DEDICATION

I would like to dedicate this dissertation to Jehovah the Almighty for His unconditional love and for making me the person I am today. To my beloved parents, my late mother and my Father and, my heartfelt thanks that my family are pillars of my life and the lives of my brothers, sister and my girlfriend.

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CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1. INTRODUCTION

Over the past decades the power of digital technologies as a catalyst for the success of small and medium-sized businesses cannot be underestimated (Bazhenova, Taratukhin, & Becker, 2012). Globally, especially in European countries and the United States of America (USA), the usage of digital technology in small and medium-sized businesses has helped to sustain success for a number of businesses in this sector (Ashrafi & Murtaza, 2008). Paradoxically, in Sub-Saharan African countries, the use of digital technology in small and medium-sized businesses is constrained by a number of factors such as insufficient funding, lack of resources and qualified personnel (Ashrafi & Murtaza, 2008; Bazhenova et al., 2012). Therefore, the development of solutions in developing countries should consider these countries' peculiarities. Additionally, extensive research is needed to examine the existing problems, in the micro and macro environment.

The creation of appropriate infrastructure, financial and legal foundations is widely discussed as solutions to these peculiarities in current literature (de Argaez, 2016; Donga, Ngirande, & Shumba, 2016; Mbuyisa & Leonard, 2016; Miraz & Habib, 2016). Other solutions to consider can be the usage of Enterprise Resource Planning (ERP) systems, as argued by Bazhenova et al. (2012). ERP systems can be a process-oriented approach which helps the SMMEs in developing countries to improve their competitive position, reduce costs and improve efficiency and control of its activities. Other than the ERP systems, a growing number of representatives of small and micro enterprises in developing countries express readiness to invest in mobile software integrated business applications and services for the growth and maintenance of their business. Therefore, the adoption of mobile practices can be used to mitigate current problems in the usage of digital technology for small and medium-sized businesses for developing countries (Schaper & Pervan, 2007). The implementation of ERP-system and mobile technologies on SMMEs however, does not always yield positive results because of the following reasons:

- i. The uniform structure of ERP together with the complex process of parameters setting is not always acceptable for SMMEs which are characterized by limited resources such as money, staff and IT-skills.
- ii. Current proposed products and services on the market services are not suitable (Bazhenova et al., 2012).

Thus, continued research on the role of innovative digital technology for SMMEs in emerging markets is an important factor in the development of small and medium businesses. Nonetheless, there is also a need to adapt the existing solutions to the real needs and possibilities of small and medium businesses and the creation of specialised solutions for SMMEs, different from those used in large companies.

1.2. Background of the Study

According to (Apulu, Latham, & Moreton, 2013; de Argaez, 2016; Okechi & Kepeghom, 2013; Olise, Anigbogu, Edoko, & Okoli, 2014) small and medium enterprises (SMMEs) not only play an important role in the economy of a country but are crucial to the country's economic stability. In most countries, SMMEs generate a substantial share of the GDP and they constitute a key source of job creation as well as a rich breeding ground for entrepreneurship and new business ideas. The United States of America, United Kingdom (UK), Japan, Australia, New Zealand, Canada and other developed, and developing countries are making policies to facilitate the growth of SMMEs. Realizing the importance of digital technology; New Zealand spend about 10% of its GDP on digital technology, making it the top ranking country in the world (IW Stats, 2016). Estimates from the World Bank indicate that SMMEs have contributed over 55% of GDP in OECD countries and between 60 to 70% of GDP in middle-income and low-income countries generating 60 to 70% employment (Ashrafi & Murtaza, 2008). The above facts show that SMMEs play a very important role in the growth of the economy of a country, and South Africa is not an exception.

Digital technologies have become ground-breaking and cutting edge in the transformation of businesses in the new age (Bazhenova et al., 2012). Increasingly, it has forced businesses at all levels to become full-time web-based business players for market visibility and survival in this highly competitive environment (Ladokun, Osunwole, & Olaoye, 2013). However, in terms of technology adoption, it is still broadly believed that the South African SMME environment is still in its infancy, in spite of the growing number of Internet usage in this country (IW Stats, 2016). Statistics show that the Internet-user base in South Africa increases by 4% Year-on-Year (YoY) in January 2016 to 52.6% (28.6 million total penetration), (just 2% more of half the population (IW Stats, 2016; IL Stats, 2016). Despite this growth rate in the digital technology usage, research still shows that both the strategic use of digital technology and digital technology as a concept are major problems facing the South African SME sector (Mbuyisa & Leonard, 2016).

1.3. Identification of the Research gap

There are very few studies on digital technology adoption by SMMEs in developing countries (Mbuyisa & Leonard, 2016; Mutula & van Brakel, 2006; Temtime, 2003). Several studies investigating adoption of digital technology in SMEs, found that one of the major factors inhibiting digital technology diffusion and intensive utilization is poor physical infrastructure (de Argaez, 2016; Kapurubandara & Lawson, 2006; Ladokun et al., 2013; Ssewanyana & Busler, 2007). In developing countries, some of the digital technology adoption challenges include legal and regulatory issues, weak digital technology strategies, lack of research and development, excessive reliance on foreign technology and ongoing weaknesses in digital technology implementation (Mbuyisa & Leonard, 2016). Against this background, the current study investigated the efforts being undertaken by SMMEs at Vhembe District Municipality town in South Africa to embrace digital technologies.

1.4. Research Problem

From the above-mentioned research gaps, the problem statement reads:

The use of digital technologies in SMMEs across the world has proven record for sustaining and ensuring the growth of such business entities. However, the adoption and use of digital technologies in SMMEs across South Africa is not universal due to several constrains; chief among them include varying access to digital technology infrastructure, digital technology services, user digital technology skills and managerial support. This study, therefore, argues that government policies directed at facilitating the growth of SMMEs by supporting and ensuring that these four factors are implemented has an impact on the performance of such entities.

In this regard, SMMEs in Vhembe District Municipality continue to encounter problems such as: (1). acquiring and use state of the art ITC infrastructure, (2). problems with access to digital technology services like cloud storage and services, (3). problems associated with hiring digital technology skilled personnel or training internal workers to the required digital technology competence levels, (4). lack of or limited management support in SMMEs to invest immensely in digital technologies and (5). Comprehensive government policies on paper, but with minimal deliverables and support towards the practical assistance (i.e. funding, cubing unfair competition) to SMMEs. It is these problems that the present study seeks to respond to and establish solutions.

1.5. Aim of the Study

The aim of this study is to investigate the impact of digital technology on SMMEs in Vhembe District Municipality and propose a framework that guides the fusion of innovative digital technologies into SMMEs.

1.6. Research Objectives

This study seeks to realise the following objectives:

- To establish the impact of digital technology infrastructure of SMMEs in Vhembe District Municipality
- To explain the role and impact of digital technology services and how do SMMEs at Vhembe District Municipality benefit from using them as a competitive tool
- To investigate the digital technology skills required for SMMEs to be successful
- To examine the role of digital technology management in SMMEs
- To validate proposed framework that guides the fusion of innovative digital technologies into SMMEs

1.7. Research Hypothesis

The following are the hypotheses for this study:

H₁: Access to digital technologies positively influence SMMEs' performance (overall performance).

H₂: Access to digital technology services (current information) positively influence SMMEs' performance.

H₃: High digital technology user-skills influence SMMEs' performance.

H₄: Management support for digital technology use influence SMMEs' performance

H₅: Government policy on digital technology positively influence SMMEs' performance.

1.8. Contributions of the Study

Studies of the socio-economic implications of digital technology usage in the developing world are rare. Against this background, the study will contribute to the body of knowledge by establishing the extent to which the application of digital technology in SMEs is enhanced. The theoretical implications of this study were twofold: The study enhanced an understanding of the use of digital technologies for business by SMEs and established how digital technology enhance SMEs. In addition to the later implication, this study contributed to the practical application for the design of improved university digital entrepreneurship environment and education that influence business information systems students' inclination towards entrepreneurship specifically in the South African setting by identifying entrepreneurial initiatives to promote the development of attitudes and intentions towards entrepreneurship.

1.9. Limitations of the Study

The study was restricted only to SMEs in Vhembe District using digital technologies conclusions on this study may not be applicable to the general population. It was also anticipated that some elements of the described sample would not be able or willing to respond and this would compromise the quality of the data collected. Lastly, the study was not conducted to SMEs across South Africa due to time and budget constrain.

1.10. Structure of the Dissertation

Chapter 1: Introduction - This chapter provides a general overview of the study, introduction and motivation, research problem and research question, formulated hypotheses, objectives of the study and a brief explanation of the methodology applied in this study.

Chapter 2: Literature Review – This chapter provides a comprehensive literature review on micro entrepreneurs and microenterprises in South Africa and digital technologies. Furthermore, the development of the proposed framework is presented.

Chapter 3: Research Methodology - This chapter provides a comprehensive description of the research methodology used in this study, the sample frame, data collection process, data analysis, time frame and the budget. The evaluation of research design and ethical issues are also discussed.

Chapter 4: Data Analysis and Results – In this chapter collected data is analysed and findings are discussed. The discussion of the findings is related to the reviewed literature.

Chapter 5 Conclusions – This is the final chapter, and it contains the implications and limitations/challenges of the study. Finally, concluding remarks and suggestions for future researchers are discussed.

CHAPTER TWO: LITERATURE REVIEW

2.1. CHAPTER OVERVIEW

This chapter provides insights into the concepts, SMEs, digital technology and a review of literature on entrepreneurship and the usage of technology in business. Various definitions proffered by previous authors pertaining to digital technology and SMEs are discussed. The background of and motivation for the study were provided in the previous chapter. The trends on digital technologies in entrepreneurship will be discussed. Then, the proposed framework as it relates to the research will be presented. Lastly, the development of the research problem is outlined. Figure 2.1 outlines the sequence of the rest of the chapter.

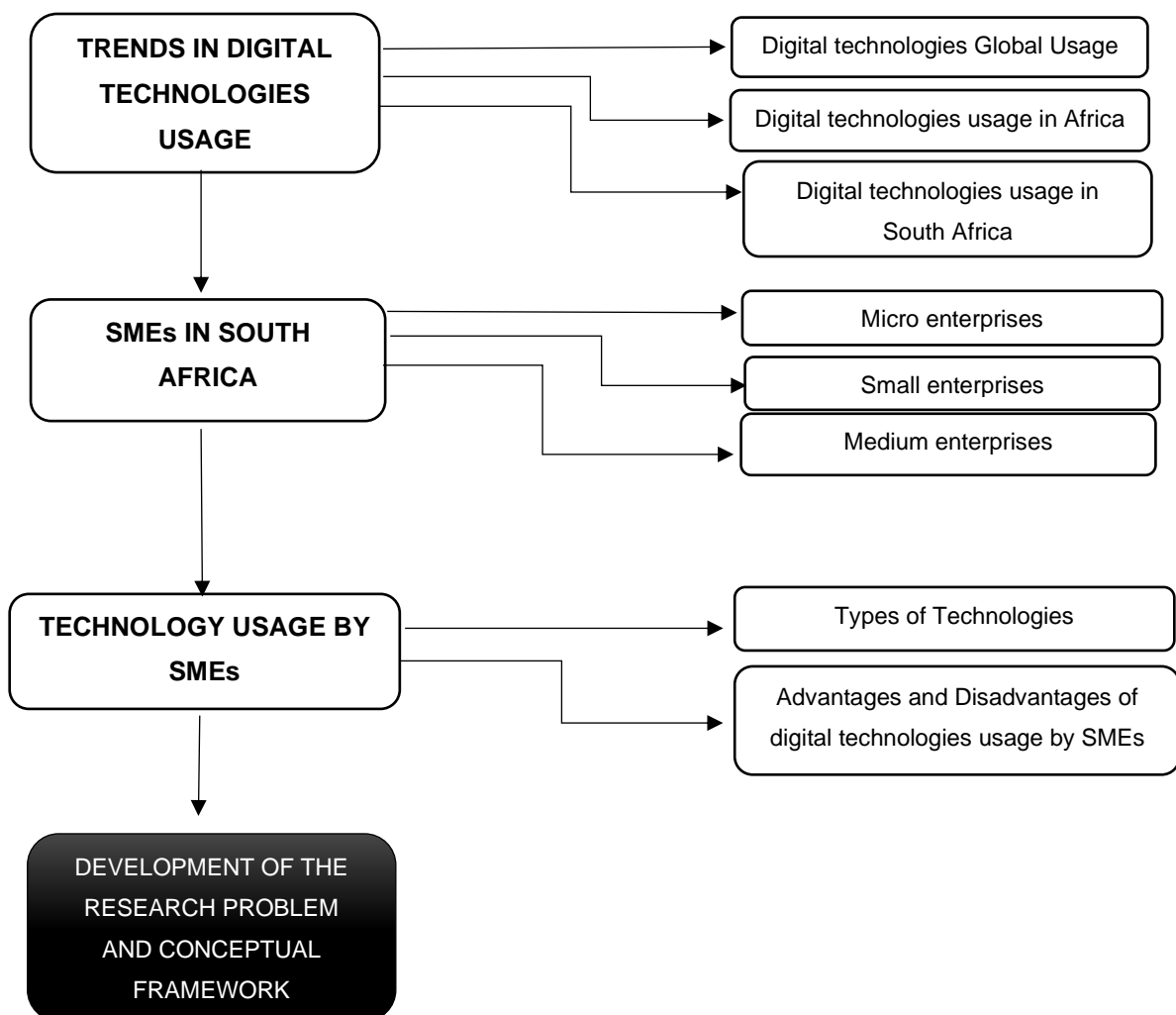


Figure 2.1: Literature Review Process

Source: (Researcher's own construct)

2.2. INTRODUCTION

A vibrant small to medium enterprise sector in any country is important for the growth of the economy (Adebayo, Balogun, & Kareem, 2013). This is particularly true for a developing country such as South Africa, where unemployment rate is high, and the economy is sluggish. The application of technology in business has been identified as a strategy for sustaining businesses and the economy. The utilization of technology by SMEs reduces costs, enhances productivity and improves efficiency. Despite a growing body of literature (Adamczewski, 2016; Baller, Dutta, & Lanvin, 2016; Belkhir & Elmeligi, 2018; Byrne & Corrado, 2017; Ibrahim & Jebur, 2019), reporting the use of technology in business, very little research attention has focused on the phenomena in developing countries. Less research has focused on SMEs in South Africa. Therefore it is relevant to investigate the usage of digital technologies by SMEs in South Africa.

This study, among other things, (a) describe the distinctive behaviour and development characteristics of SMEs, (b) explain the role and impact of digital technology and how SMEs in Vhembe District benefit from using it as a competitive tool, (c) identifies the key driving forces of digital technology adoption and usage by SMEs in Thohoyandou, and (d) identifies the challenges faced by SMEs in digital technology adoption.

2.3. TRENDS OF DIGITAL TECHNOLOGY USAGE

According to the Global information technology report (GITR) 2017-2018, (McGann, 2019), digital technologies have been transforming the world dramatically for the last few decades, enabling innovation and productivity increases, connecting people and communities, improving standards of living and opportunities across the globe. While changing the way individuals live, interact and work, digital technologies have also proven to be a key precondition for enhanced competitiveness and economic and societal modernisation, as well as an important instrument for bridging economic and social divides and reducing poverty (GITR, 2016).

2.3.1. Digital technology: A Global Perspective

According to Lyall (2016), the first global system for mobile telecommunications phone call took place in 1991 in Finland. Only 15 years later, there were over 2 billion GSM users. In November 2007, every second inhabitant of this planet possessed a mobile telephone. The

first billion mobile phones took around 20 years to sell worldwide. The second billion were sold in four years. The third billion were sold in two years. Coverage has expanded and mobile phone subscriptions in developing countries have increased by over 500% since 2012. In 2016, there were over 6 billion mobile phones in use across the emerging world (GITR, 2016). The GITR (2016) suggest that digital technologies usage have impacted positively on basic services from 2012-2016 (see Figure 2.2).

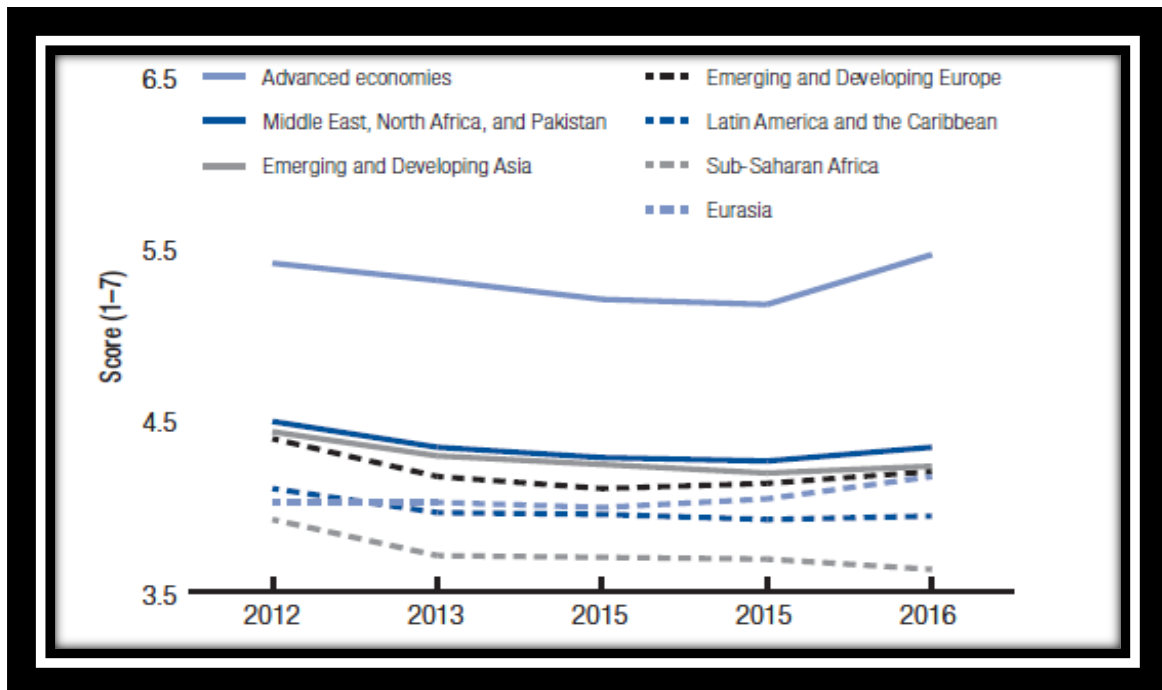


Figure 2.2: Impact of digital technologies access on Basic Services (2012-2016)

Source: (GITR, 2016)

2.3.2. Digital technology in Africa

Mobile phones, especially smart phones represent more than 90% of all telephones in Africa (Langa, 2013). Market penetration passed the 15% mark in early 2012, with an annual growth rate of approximately 5%. Individual markets are still growing at 50% per annum or more, and others stand at less than half the penetration rate. The continent's most advanced markets (state them here, e.g. South Africa and Nigeria) have passed the 100% penetration mark (Langa, 2013). GSMA (2016) found that the average penetration rate of smart phones in Africa from 2010 to 2018 can be predicated to 6.2%, the highest being the period of 2015-2017 with 7% growth rate (see Figure 2.3)

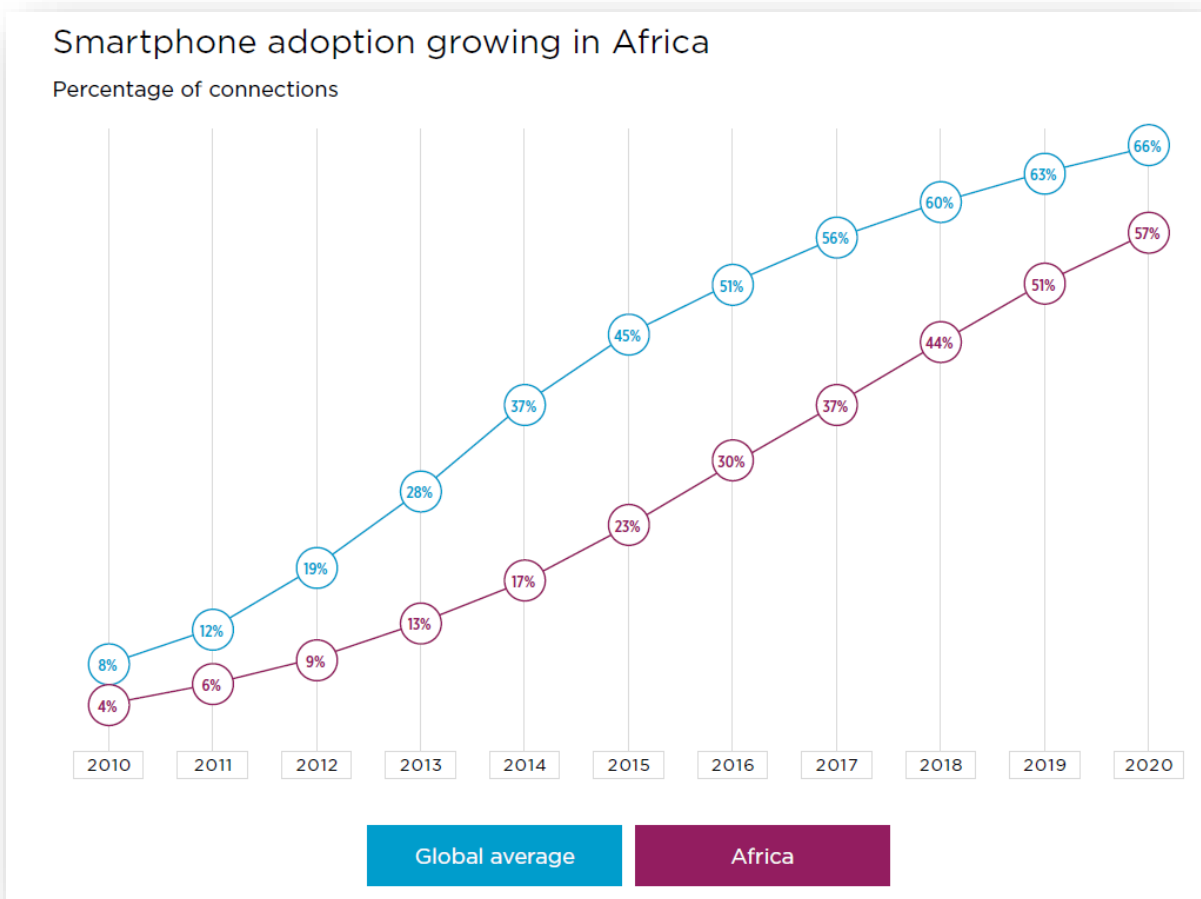


Figure 2.3: Mobile phone penetration rates in Africa (per cent)

Source: GSMA (2016)

Africa's telephone subscribers are concentrated in cities, and in the relatively more prosperous countries in the continent, particularly South Africa and Botswana.

2.3.3. Digital technology in South Africa

In 2017, South Africa had a total population of 55, 21 million people, with an urbanisation rate of 66%. Within that, 28, 6 million (52%) people utilise the Internet in some format. This has increased by 7% since January 2016 (GITR, 2016). About 15 million users make use of social media platforms, with a 27% penetration rate of the total population. Then 13 million users do so purely from mobile cell phones, with a 24% penetration rate (GITR, 2016). This increased from January 2016, with an additional 2 million (15%) new active social media users, and 3 million (30%) new active social users (GITR, 2016).

2.4. CLASSIFICATIONS OF SMEs

The South African National Small Business Act of 1996 classifies small businesses into four categories: micro, which includes survivalist enterprises, very small, small and medium. In South Africa the government, specifically the Department of Trade and Industry, makes use of a combination of annual turnover by sector and number of employees to define an enterprise as small, micro, medium or large (Timm, 2011). Therefore, a small business is defined as an enterprise which has 50 or less employees.

In the manufacturing sector businesses are defined as microenterprises if they have a turnover of R2 million, as very small enterprises if they have a turnover of R5 million, as small enterprises if they have a turnover of R12 million and as medium enterprises if they have a turnover of R51 million. For wholesale traders, commercial agents and allied service businesses are classified as micro enterprises if they have an annual turnover of R0.2 million, as very small enterprises if they have a R6 million turnover, as small enterprises if they have a R32 million turnover and as medium enterprises if they have a R64 million turnover (South Africa, 1996) (GSMA, 2016). In the finance and business services sector businesses with a turnover of R2 million are defined as microenterprises, those with a R3 million turnover as very small enterprises, those with a R13 million turnover as small enterprises and those with a R26 million turnover as medium enterprises (GITR, 2016).

Lastly, in the community, social and personal services sector businesses with an annual turnover of R0.2 million are defined as micro enterprises, those with a R1 million turnover as very small enterprises, those with a R6 million turnover as small enterprises and those with a R13 million turnover as medium enterprises (GITR, 2016). The respective definitions used by the South African government to classify SMMEs are listed in Table 2.1.

Table 2.1: Definition of microenterprises per sector

Sector	Micro	Very small	Small	Medium
Manufacturing	R2m	R5m	R12m	51m
Wholesale trade, commercial agents and allied services	R2m	R6m	R32m	64m
Finance and business services	R2m	R3m	R13m	26m
Community, social and personal services	R2m	R1m	R6m	13m

Source: (Timm, 2011)

2.4.1. Micro enterprises

In South Africa microenterprises are small businesses operating in the informal economy, providing goods and services for income, with one to five employees (GITR, 2016). Examples of microenterprises in the South African context are hawkers, Spaza shops, handcrafters and street vendors (Rogerson, 2008). Because they operate in the informal economy, they evade payment of taxes, meaning that they do not pay any taxes to the government (de Argaez, 2016; El Kadiri et al., 2016). About 98% of African businesses are microenterprises and are an essential source of creating employment and alleviating poverty (Ibrahim & Jebur, 2019).

Most microenterprises operate in the second economy where there is an abundance of unskilled labour that does not meet the requirement of developed countries. Therefore, the economy of microenterprises improves the average production of labour of the country at large by providing jobs for unemployed low-skilled people who do not have adequate skills and knowledge to be employed in large businesses (Ibrahim & Jebur, 2019). In Chile, one-fourth of the labour force works in microenterprises; in Columbia, nearly one-half and in Bolivia, more than one-half of the labour force is estimated to work in microenterprises. From 2010 to 2017, 90% of new jobs created in Bolivia were in microenterprises and the informal sector (Ibrahim & Jebur, 2019).

According to GSMA (2016), in 2015 South Africa had an estimated 591000 self-employed people and employers with a turnover of less than the value-added tax (VAT) limit of R150 000. Approximately 200000 of these enterprises were considered as survivalist, since their turnover was less than R1000 per month. These enterprises have largely been created as a basic source of income by the unemployed. Furthermore, 400000 enterprises were microenterprises, approximately 137000 of which contributed to employment by employing at least one employee.

2.4.2. Small enterprises

The small business sector in South Africa has the potential to contribute to job creation and economic growth, whilst at the same time redressing historical imbalances and increasing black economic participation (GSMA, 2016). Moreover, (El Kadiri et al., 2016) posit that more than 80% of businesses in South Africa are small businesses.

Research indicates that in 1995 the overall contribution to the total GDP was an estimated 20.8% by small enterprises, 11.9% by medium enterprises and 67.3% by large enterprises.

Contribution to formal employment was estimated at 29.5% by small enterprises, 15.3% by medium enterprises and 55.2% by large enterprises (GSMA, 2016).

2.4.2.1. Advantages of small businesses

(Andreassi, 2003) identifies the following advantages of small businesses:

- Small businesses are far less bureaucratic, which allows the decision-making process to be faster than in larger firms.
- A small firm can be much more flexible than a larger firm, which allows the firm to tailor its products and services to the exact needs of potential and current customers or clients.
- Small firms are capable of learning at a faster pace than larger organisations and adapting the most efficient routines and strategies.
- Small firms have a greater advantage on technical aspects because of governmental structures which support small businesses, which subject them to fewer regulations compared to larger firms.
- Because of their size, larger firms could be excluded from some markets. This situation provides substantial opportunity for small organisations, which have lower overhead costs, to fill isolated niches.

2.4.2.2. Disadvantages of small businesses

(Andreassi, 2003) lists the following disadvantages of small businesses:

- Many entrepreneurial managers lack formal management skills, and this is among the main reasons small businesses fail. A lack of the most needed skills in business training often leads to bankruptcy. Relatively few owners of small businesses have the professional skills of a market or an attorney. In most cases professionals, should be sourced externally when needed.
- Some small firms mismanage funds. Furthermore, many starts without having adequate financial resources and run short of funds while still in the early stages of growth. They often lack resources to survive in turbulent economic conditions or even to expand should they be successful.

- Small businesses often do not have adequate time and resources to forge suitable external networks. Consequently, they forgo the advantage of establishing links and networks that could be of considerable value to the organisation.
- Small organisations across the globe cannot cope with complex government regulations and red tapes. They are unable to cope with extensive paperwork and often use external resources to complete the necessary forms and reports. This places a tremendous burden on the financial position of these small firms.

2.4.3. Medium enterprises

As previously mentioned, in terms of the National Small Business Act of 1996, medium enterprises have between 51 and 200 employees and a turnover of between R5million to R50 million. They are further defined based on a specific sector: manufacturing with a turnover of less than R51 million, finance and business services with less than R26 million, community, social and personal services with less than R13 million and wholesale traders, commercial agents and allied services with less than R64 million.

Medium enterprises are an essential part of the country's economy (Jameel, Abdul-Karem, & Mahmood, 2017). The significant contribution of these enterprises in economies is important to many countries as they play an essential role in creating employment (Levy & Powell, 2005).

2.5. TECHNOLOGY USAGE BY SMES

There is increasing empirical evidence that the usage of digital technologies in entrepreneurship will possibly aid microenterprises gain competitive advantage and enhance their chances of survival in the market (Pathan, Zeng, Latif, & Memon, 2017; IW Stats, 2016; Xu, Xu, & Li, 2018). It is believed that the use of digital technologies in small businesses will possibly improve communications (i.e. between suppliers and customers), reduce the cost of operation (i.e. day-to-day travelling, cost of buying stock and meeting customers) and improve access to information and knowledge (i.e. being informed about prices regarding the business) (Miraz & Habib, 2016; IW Stats, 2016).

Digital technologies can assist small and micro businesses in overcoming some challenges by providing better access to information and expertise, reaching new markets and customers (or more generally, stakeholders), administering the business more efficiently and effectively, and growing the knowledge and skills needed to run the businesses better (Olise et al., 2014).

Olise et al. (2014), suggests that the development of impoverished communities can benefit from using digital technologies because the use and understanding of technology greatly improve per capita productivity. Table 2.2 shows how the use of digital technologies can create a competitive advantage over those that use digital technologies in their businesses in Tanzania and Kenya. It would have been of value to present figures for South Africa, however, these figures are not available in South Africa.

Table 2.2: Use of digital technologies by sector and country

Percentage of enterprises that:	Tanzania			Kenya		
	Food	Textile	Tourism	Food	Textile	Tourism
Don't have any digital technologies	22.4	31.9	2.6	18.4	52.8	0.0
Have a phone (fixed and mobile)	76.3	64.0	97.4	81.6	45.3	100.00
Have a fax	13.6	2.0	74.4	30.6	11.5	66.0
Have a computer	3.4	4.0	35.9	2.0	1.9	10.0

Source: (Wolf, 2001)

Pathan et al. (2017), asserts that economic productivity is increasingly tied to access to technology and knowledge. Through business transformation, digital technologies may enable an entrepreneur to accomplish aims and objectives of a business (Baller et al., 2016). Research has shown that when microenterprises adopt digital technologies they can achieve a growth of 3.8% in sales (see Table 2.3 below) and that the innovative use of digital technologies can provide new opportunities for microenterprises (Pathan et al., 2017). It is envisaged that digital technologies enable informal businesses to save money and travel time, compare prices, transact with existing customers and increase their customer network (Baller et al., 2016).

Several studies have identified digital technology as one of the key tools that increases the chances of the success of businesses (Belkhir & Elmeligi, 2018; Byrne & Corrado, 2017; de Argaez, 2016). The use of mobile devices allows businesses to communicate more efficiently with suppliers, customers and business associates, thus improving their competitive advantage in the industry, facilitating market research and improving information access (Inmyxai & Takahashi, 2010).

Table 2.3: Effect of digital technology use on firm performance in developing countries

Enterprises	Not using digital technologies	Using digital technologies	Difference
Sales growth (per cent)	0.4	3.8	+750%
Employment growth (per cent)	4.5	5.6	+24%
Profitability (per cent)	4.2	9.3	+113%
Labour productivity	5,288	8,712	+65%

Source: (World Bank, 2012)

Consequently, it is believed that digital technologies play a significant role in promoting economic development and enhancing business activities (Canali, Addabbo, & Moutzi, 2019). In many developing economies, digital technologies have become the focus as a means of reducing poverty, promoting businesses and encouraging competitiveness in the global economy.

2.5.1. Types of technologies

According to (Herrington, Kew, Kew, & Monitor, 2010), digital technologies are recognised as an important tool for businesses, helping businesses to remain competitive and to gain competitive advantage globally as well as within domestic markets. The use of digital technologies in microenterprises is often limited to less complex technologies, such as personal computers, laptops, telephones, mobile phones, fax machines, photocopiers, televisions and radios (see Table 2.4). This limitation is caused by the restricted financial resources accessible to their nature of business (Donner, 2004; Esselaar, Stork, Ndiwalana, & Deen-Swarray, 2007). With the initiation of personal computers, broadband Internet and mobile devices such as mobile phones, smartphones, tablets and iPads, digital technologies have become an important driver in fostering innovation, leading to enhanced firm productivity and economic growth (World Bank, 2012).

Table 2.4: Types of technologies

Types of technologies	Purpose
Computers/laptops	Preparing business and personal documents such as business plans, keeping records of the business, recoding business transactions.
Mobile phones	Communicating with suppliers, customers, family and friends.
Photocopiers	Used to make copies of the price list and other related business information that needs to be circulated to customers and suppliers.
iPads, tablets and Galaxy Tabs	Communicating with suppliers, customers, family and friends.
Fax machines	Communicating with suppliers and customers in terms of using hard copies.
Televisions and radios	Being informed about the prices and special deals regarding the business.

2.5.2. Advantages of digital technology use by SMEs

The use of digital technologies provides the following advantages to SMMEs:

- a) **Access to new markets:** Using digital technologies, for example web advertising, social networks such as Facebook, LinkedIn and Twitter, or other methods of communication, can enable the business to obtain new customers., To some extent, this may be seen as a digital technology-facilitated increase in an entrepreneur’s “social capital”(Greve & Salaff, 2003), which allows entrepreneurs to discover opportunities, secure resources and obtain legitimacy (Elfring & Hulsink, 2003).
- b) **Administrative efficiency:** This is the ability to operate day-to-day activities of the business more efficiently. Digital technologies such as digital calendars, accounting systems and timekeepers reduce the administrative and operating cost associated with basic business tasks (Jameel et al., 2017).
- c) **Access to information and knowledge:** Digital technologies enable businesses to discover information that was previously inaccessible. For instance, digital technologies may help small businesses in obtaining information about local pricing fluctuations, or about the competition (Jameel et al., 2017). This provides businesses with access to relevant information regarding the market they are in. For example, Spaza News is an online newsletter that provides Spaza shop owners with information and knowledge about opportunities such as microfinance, advice, tips and regulations (Spaza News, 2010).

- d) **Productivity:** Businesses can increase production using digital technologies. Research indicates that use and understanding of technology greatly improve per capita productivity (Benoit et al., 2002; Kosempel, 2007; Wolcott, Kamal, & Qureshi, 2008). Productivity may also imply the employment of previously disadvantaged individuals (Kamal & Qureshi, 2009).
- e) **Competitiveness:** This is the ability to improve the efficiency of management, making the business environment more transparent and enabling and facilitating access to financial services and other resources (World Bank, 2012).
- f) **Accelerate economic growth:** Empirical evidence shows that, on average, businesses that use digital technologies grow faster, invest more and are more profitable than those that do not use the technology (World Bank, 2012).

2.5.3. Challenges of digital technologies faced by SMEs

(Barba-Sánchez, Martínez-Ruiz, & Jiménez-Zarco, 2007), indicate that small business owners possess little or no training on digital technologies and lack awareness of the benefits that digital technologies may provide to their business. The result is a major barrier to digital technology adoption. The smaller the enterprise, the greater this problem, since most small companies are not using digital technologies for their business activities. Therefore, it appears that digital technologies are hardly adopted as readily usable technologies due to lack of the know-how skills by average entrepreneurs (Piscitello & Sgobbi, 2004).

Other challenges that prevent them from obtaining and enjoying the benefit of digital technologies are (a) lack of knowledge in applying digital technologies in their businesses, (b) affordability, and (c) attitudes (Wolcott et al., 2008). They are described as follows:

- a) **Lack of knowledge:** Challenges are caused by lack of digital technology skills, planning and knowledge to apply digital technologies to support the business activities of the microenterprises (Parkinson & Ramirez, 2007).
- b) **Affordability:** Micro enterprises cannot afford the time, finance and information to use digital technologies, which leads to failure in using them (Moyi, 2003).
- c) **Attitude:** Resistance to technology, for example, also affects use of digital technologies in microenterprises and may affect the confidence of micro entrepreneurs to use digital technologies. Microenterprises that have acquired digital technologies may also face challenges in terms of support to implement and maintain digital technologies (Wolcott et al., 2008).

2.6. THEORETICAL REVIEW, PROPOSED FRAMEWORK AND HYPOTHESES DEVELOPMENT

The Technology Acceptance Model (TAM) was developed by Davis, Bagozzi, and Warshaw (1989) and is widely used in understanding the acceptance of technologies. The theory states that an individual's decision to adopt and use a given technology is influenced by his/her perceived ease of use and usefulness of that technology (Donga et al., 2016). TAM has two major constructs as explained below:

1. *The Perceived ease of use of technology*: This is a key determinant in the use of technology as perceived by users and customers in the organization. The technology or innovation is much adopted by users when they consider the use of such technology as easier (Davis et al., 1989).
2. *The Perceived usefulness of technology*: Davis et al. (1989) argues that users can perceive the benefits expected from the system by making use of it. Such perception influences their decisions to accept and use a specific system.

The theory has been criticized for failing to account for the influence of the external factors in the environment such as economic factors, competition from customers and suppliers (Mutua, Oteyo, & Njeru, 2013). The TAM model project various view of users perceptions regarding the ease of use and usefulness of the technology (Davis et al., 1989).

2.6.1. Technology Organization Environment Model (TOE)

Temtime (2003) states that innovation adoption depends on technological, organizational and environmental factors. The TOE model incorporates the three determinant factors of the technology, organizational factors, and macro-environment factors (Miraz & Habib, 2016). Donga et al. (2016) suggest factors that affect e-business acceptance and usage in small and medium enterprises as organizational readiness, top management support, financial resources, and perceived cost of deploying digital technology. The model adopts three factors namely environmental, organisational and technological which affect digital technology adoption: technological, environmental, and the organization perspective as shown in Figure 2.4.

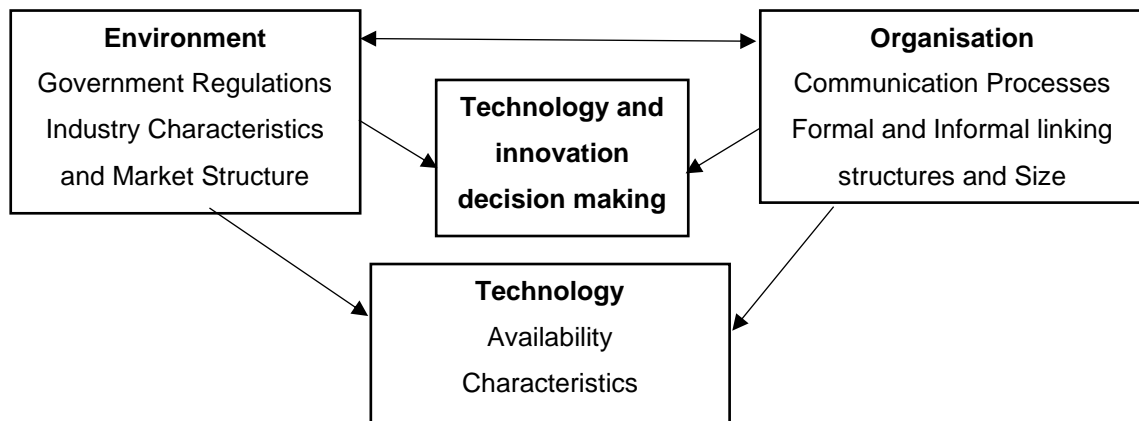


Figure 2.4: Technology Organization Environment Model

Source: Adopted from (Oliveira & Martins, 2011)

Technological Perspective: According to Okechi and Kepeghom (2013) the organization should demonstrate an understanding of the digital technology innovation characteristics. These characteristics help in redesigning and alignment of business activities to be integrated into the digital technology service applications and current systems to boost SMEs performance. There should be installation and integration of digital technology with the existing business services which meet the end users' requirements.

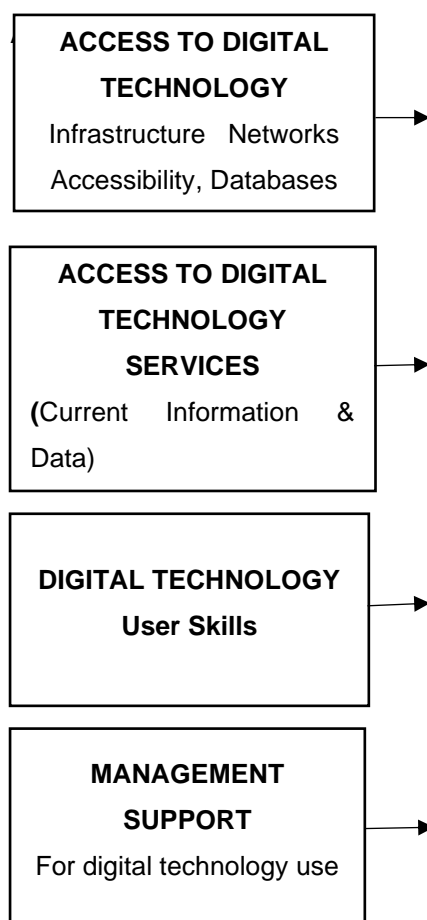
Environmental Perspective: Mutua et al. (2013) points out that the environmental perspective is concerned with influences surrounding the business such as government policies. Donga et al. (2016) reveal that these external factors affect the way SMEs interpret the need for innovation and deployment where they can either support or deny technological innovation. The government regulation can affect an SME's activities where the costs of production can rise due to mandatory regulations policies criteria.

Organizational Perspective: There is a wide range of characteristics as firm size, managerial structure complexity and manager support. The top executives can strengthen the organizational growth by enhancing and collaborating a distinct image of the SMEs, goals, strategies and core values and facilitating consistent linkages within and outside on digital technology interaction (Donga et al., 2016). The TOE models are significant to the study in that they can bring out the independent variables which underpins the study. These include the manager's support, government regulations and policies, digital technology services and digital technology infrastructure.

2.6.2. Empirical Review

Based on several empirical studies done in this area in dissimilar developed and developing countries, particularly on digital technology and other invention perspective. Adoption of digital technology is a means to enable these businesses to compete on a global scale, with better competence, and closer client and supplier relationships. Consequently, SMEs should consider digital technology as an important approach in their business to take competitive advantage from the global markets. Set variables such as management support, digital technology infrastructure, digital technology services, government support, digital technology user skills and, cost, which affects the adoption of digital technology among SMEs dominate the digital technology adoption discourse. These independent variables which influence digital technology adoption make up the building blocks of the proposed framework of this study. These include digital technology infrastructure, digital technology services, digital technology user skills, and management support. The dependent variable will be performance of SMEs and government policy will act as an intervening variable as shown in Figure 2.5.

Independent Variables



Dependent Variable

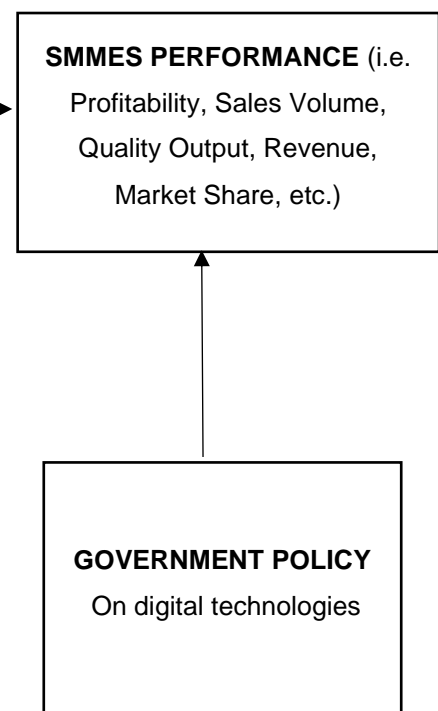


Figure 2.5: Proposed Framework

As shown in Figure 2.5 the researcher proposes incorporating into the conceptual model, government support as the main moderator between established adoption independent variable (marketing-related mobile activity) and performance of the SME. In the proposed conceptual model (See Figure 2.5), government policy (the moderator variable) contains antecedents of government support and these are; financial support, policy formulation, licensing and tax incentives. These antecedents and all the other variables are explained briefly below:

2.6.2.1. SMEs Performance

Ashrafi and Murtaza (2008) reveals that digital technology adoption facilitates effective communication between SMEs and their customers, improve customization, market awareness, marketing costs reduction, escalation in the loyalty of customers, increased sales capacity, profitability and performance. These, however, create a stronger customer base, competitive advantage and boost the growth of enterprises. Therefore, the digital innovation includes dimensions such as computers, mobile, internet, telephone systems as well as online electronic applications and broadband technologies as broad.

The explosion of digital technology adoption by SMEs has posed great benefits in the promotion of economic growth as established by several studies (Djatikusumo, 2014; Ladokun et al., 2013; Mbuyisa & Leonard, 2016). Therefore, a number of SMEs in developing countries are adopting digital technologies due to the benefits that come with it (Adebayo, Balogun, & Kareem, 2013). Commonly, digital technologies have benefits across a broader range of business services, transactions, operations and performance. Most of SMEs are slowly appreciating the positive results of digital technology as increased sales due to internet presence, better communication and linkages via electronic mail and efficient practices hence improves coordination, optimization and utilization (Olise et al., 2014). Based on the proposed framework for this study (see Figure 2.5) the following hypotheses were formulated:

H₁: Access to digital technologies positively influence SMMEs' performance (overall performance).

H₂: Access to digital technology services (current information) positively influence SMMEs' performance.

H₃: High digital technology user-skills influence SMMEs' performance.

H₄: Management support for digital technology use influence SMMEs' performance

H₅: Government policy on digital technology positively influence SMMEs' performance.

2.6.2.2. Digital Technology infrastructure

According to Olise et al. (2014), most of developing countries still remain behind as compared to developed countries in digital technology infrastructure (i.e. easy access to the internet, phones and other infrastructure) since they are well situated. The same authors further argue that despite the use of the internet by some SMEs they still fear to use it for transactions because of perceived lack of security and privacy issues. Some of the technological factors involved reliability, technology availability, capabilities, security and attitude regarding technology compatibility, relative advantage, and complexity issues. To boost the business's markets reach and enhance operation effectiveness and efficiency digital technologies and innovations such as internet services are more critical to performance of SMEs. However, SMEs are not able to invest on such digital technology infrastructure as servers, fibre optics and other applications due to their complexity, availability and cost (Djatikusumo, 2014).

2.6.2.3. Digital Technology services and costs

Djatikusumo (2014) opines that the overall, maintenance and training cost are some of the issues for non-adopters and there is the reluctance of upgrading of their systems and other sophisticated digital technology service applications due to fear of the high cost of adoption. According to earlier studies (Donga et al., 2016; Mbuyisa & Leonard, 2016), most of SMEs do not completely adopt digital technologies to enhance transaction and customer service. This is as a result of the cost of implementing digital technology innovation and services and also the inability of the SMEs to access aid from financial institutions. They also cannot afford to adopt applications like customer relationship management (Donga et al., 2016; Mbuyisa & Leonard, 2016).

2.6.2.4. Digital Technology User Skills

The lack of digital technology user-skills is one of the challenges faced by adopters and non-adopters users of computers and the internet (Apulu et al., 2013). Moreover, most SMEs experience difficulties such as being unable to get support from internal and external expertise

responsible for digital technology control, management and organizing. Apulu et al. (2013) concurs that the lack of required managerial and technical personnel with basic digital technology expertise hinders the adoption of digital technology by SMEs thus affecting the success of technology implementation.

Miraz and Habib (2016) point out that the lack of digital technology user-skills and awareness among owner/manager requires training and education for them to address the lack of readiness of SMEs in using and adopting their electronic business potentials. However, in spite of the informants' knowledge on the copious benefits of adopting digital technology, it is realized that a number of SMEs still make use of paper-based memos in their operations, and thus suggest that SMEs are still reluctant to change the manual way of conducting business with digital technology applications making them incur more costs (Makau, Wawire, & Ofafa, 2013).

2.6.2.5. Government Policy

The government policies which can limit the entry of foreign business players may greatly impact on the SMEs availability of credit in developing countries and thereby its restriction to digital technologies have strong effects on their competitiveness (Berger & Udell, 2004). Berger and Udell (2004) argue that there are several government factors that have effects on the operation and performance of SMEs. These include regulatory issues, irregular changes in tax policies, procedures and rules and moreover if there can be stability in government policies the SMEs production capacity, growth and performance could greatly improve.

Kiveu and Ofafa (2013) states that factors such as regulations, prices, national policies on taxes, labour and trade are some of the government interventions that hinder most of SMEs in the adoption of digital technology. These inflexible government policies, unstable tax policies and inappropriate inspection procedures, issues in regulatory of digital technology infrastructure and services sometimes conducted by government authorities create discomfort and discourage the growth of digital technology adoption by this SMEs (Berger & Udell, 2004).

2.7. CHAPTER SUMMARY

This chapter provides a comprehensive literature review of the body of knowledge pertaining to microenterprises, digital technologies as well as micro entrepreneurs in South Africa. The literature was analysed and justification for the research study provided. This study will add to

the body of knowledge on the use of mobile devices by microenterprises and the strategies applied in South Africa. Furthermore, the proposed framework as related to the use of modern technologies within microenterprises was presented. The next chapter outlines the methodology used in this study and its justification.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1. CHAPTER OVERVIEW

This chapter outlines the research methodology used for data collection and analysis to answer the research questions and test the proposed hypotheses. The analysed data led to the refinement of the proposed conceptual model on digital technologies adoption by SMEs. The research methodology choices described in this chapter include research design, research sampling, data gathering and data analysis. . This culminated in the proposed framework, research problem, research question and hypotheses for the study. This chapter begins with a justification of the selected methodology in relation to the stated research problem. The sampling frame, sampling techniques and units of analysis are discussed. The sections that follow outline procedures and instruments, including pilot studies conducted prior to the main study. Some ethical issues concerning this research are also discussed. Finally, the chapter concludes by highlighting the limitation of the scope within the context of the selected methodology.

3.2. INTRODUCTION

A research method can be defined as “a strategy of enquiry, which moves from the underlying assumptions to research design, and data collection” (Myers, 2009: 5). According to Bernard (2012), the most prevalent qualifications grouping of research methods can be classified into qualitative, quantitative and mixed methods. The set-out objectives for this research will be accomplished using a quantitative research approach. Additionally, quantitative approach has been chosen because the variables involved are known and have already been tested using reliable and validated scales in the literature (Blumberg, Cooper & Schindler, 2011). The quantitative research approach permits the investigator to answer questions pertaining the association between variables aimed at predicting, explaining and controlling certain phenomena (Tolley, Ulin, Tolley, Robinson, Mack, Succop, & Robinson, 2016). To answer the research questions, which is a complex social phenomenon, the research was designed to follow the positivism paradigm. The purpose of this chapter, therefore, is to describe the methodology used to resolve the research problem. The methodology applied in this study is a descriptive single cross-sectional design (Yin, 2003a). Data was collected from the targeted respondents using a self-completion structured questionnaire. In line with the collected quantitative data, statistical analysis was conducted on the data.

3.3. RESEARCH PARADIGM AND JUSTIFICATION OF RESEARCH PARADIGM

Kuhn (1996) defines a paradigm as a set of theories and linked assumptions shared amongst a community of researchers. In contrast, Guba and Lincoln (2005) conceptualise a paradigm as a worldview and a framework that includes and spans across ontology, epistemology and methodology. For practical purposes, scientists benchmark their research within a 'commonly shared' paradigm, which guides them in not only designing the research, but also conceptualising phenomena and interpreting results within the discipline (Thompson & Perry, 2004). According to Blumberg et al. (2011:16), the "two most distinguished research philosophies are positivism and interpretivism [or constructivism], and between these two extreme positions, several other paradigms exist". For the purposes of this research the positivism paradigm was considered appropriate.

Although constructivism acknowledges the existence of a subjective world, it was unsuitable for this research for the following reasons: firstly, constructivism is more appropriate for theory-building studies, usually in grounded theory or case studies (Guba & Lincoln, 2005:193). This current research did not concern itself with building but confirming existing theories. Secondly, because researchers in constructivist paradigms are "participants" (Healy and Perry, 2000:119), findings often are "co-constructed" by their interaction in the research. In the present study, the researcher was neither a participant nor interested in building theories; therefore, interpretivism was not an appropriate philosophy for this research. The positivist paradigm is considered ideal for this study because, in relation to the research objectives, the positivism paradigm seems more suitable for solving the "what" and "how" questions relating to the adoption of digital technology by small businesses. In addition, as followed by this study, in positivism a researcher commences with a theory from previous findings or individual observations, generates some hypotheses to be verified, and gathers data that either accepts or rejects the hypotheses (Mohan, 2014).

3.4. RESEARCH DESIGN

The study will follow the descriptive single cross-sectional design Busk (2014) in which only a single sample of respondents extracted from a population of interest, and data is gathered from this sample only once. The single cross-sectional design is embedded within the conclusive research approach (See Figure 3.1) which is descriptive in nature. The conclusive approach is used when testing specific hypotheses as well as examining relationships where the analysis of primary data is quantitative (Shukla, 2008).

The key purpose of descriptive research (Kotler & Armstrong, 2012; Malhotra, 2010) is to recount a phenomenon, for instance, a market characteristic. Descriptive research has some diverse uses, such as narrating the features of groups, anticipating consumer behaviour, and establishing attitudes as well as perceptions (Malhotra, 2010). Descriptive research is also employed to establish the degree to which marketing variables are related. Furthermore, Churchill (1995) suggests that descriptive research to be further than merely collecting an extensive amount of facts. Research course relies largely on a single or several hypotheses formulated, and it is these hypotheses on which the study is based upon (Churchill, 1995). Considering the above, it becomes essential for this present study to follow the descriptive single cross-sectional design.

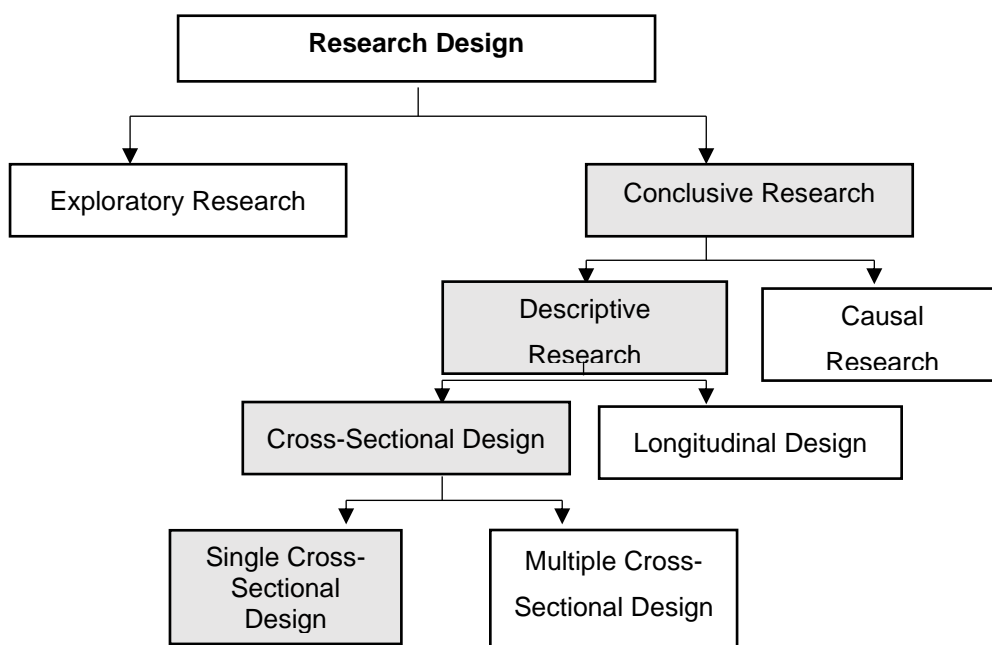


Figure 3.1: Categorisation of Research Designs (Adapted from Shukla, 2008)

3.4.1. Justification of the Methodology

The nature of the study is descriptive it seeks to explain consumer choice behaviour in relation to the selection and usage patterns of certain remote banking technologies. The constructs being measured – factors that influence choice behaviour – are “real-life” phenomena (Healy and Perry, 2000:120) that have been identified and tested in past research (Berndt et al., 2010; Black et al., 2001; Laukkanen et al., 2007; Parasuraman, 2000; Rugimbana, 1998). In many of these studies, except for a few such as by Black et al. (2001), Mallat (2007) and Szmigin and Bourne (1999), quantitative methods were utilised to measure the adoption constructs.

Therefore, the investigation employed quantitative techniques using the survey method of data collection (Calder et al., 1981).

3.4.2. Survey Methods

The survey method is particularly useful in this study for several reasons. Firstly, it ensured quality in validity and reliability, as this was the methodology applied in past research (Healy & Perry, 2000; Hubbard & Armstrong, 1994; McKinnon, 1988). Secondly, a relatively large sample across an expanded geographic coverage could easily be accessed and enhanced representativeness (Blumberg et al., 2011). Thirdly, tried and tested scales could be used to collect data rapidly using a minimal research team, which is usually in line with budget constraints imposed on doctoral theses as this one (Perry, 1998a). Fourthly, the research objectives including hypotheses necessitated the collection and analysis of quantitative data (Field, 2009). In the following excerpt, Blumberg et al., (2011: 207) elucidates on the utility of surveys:

One of the major strengths of the survey as a primary data-collecting approach is its versatility (Yin, 2003b). It does not require there to be a visual or other objective perception of the information being sought by the researcher. Abstract information of all types can be gathered by questioning others. We seldom learn much about opinions and attitudes except by surveying. This is also true of intentions and expectations

3.4.3. Study Site and Target Population

The population in this study was made up of small business owners based at Vhembe District Municipality. This study site was purposefully selected because it has some evidence of SMMEs and due to its accessibility by the researcher.

3.4.3.1. Study Area

The Vhembe District Municipality is a Category C municipality located in the northern part of the Limpopo Province. It shares borders with Zimbabwe and Botswana in the north-west and Mozambique in the south-east through the Kruger National Park. It is comprised of four local municipalities: (1) Musina, (2) Thulamela, (3) Makhado and (4) Collins Chabane (see Figure 3.2)



Figure 3.2: Map of the study area

3.5. SAMPLING STRATEGIES & SAMPLE SIZE

To obtain results which are representative of a population, it is recommended that probability sampling procedures be followed while conducting quantitative surveys. As such, sampling literature recommends the use of cluster sampling for a large population such as a town survey. Cluster sampling is a probability sampling procedure in which the elements of the population are randomly selected in a naturally occurring grouping known as clusters (Bryman, 2008). Cluster sampling inevitably leads to a multi-stage sampling process because the initial selection is of clusters and the subsequent selection is of either further clusters or population units. Thus, the researcher used the multi-stage cluster sampling technique (Bryman & Bell, 2007), whereby the population which comprised of small business owners are grouped into clusters that are Small, Medium and Microenterprises.

The multi-stage cluster sampling was chosen because it deals with a widely dispersed population as well as a complete list of all members of the population. South Africa characterises small business into various sections as such this characterisation also applies to small businesses at Vhembe District Municipality. Thus, it becomes impossible for this study to focus on all the entrepreneurs due to time and budget hence employing the multi-stage cluster sampling technique. The three-staged cluster approach as used by Haber and Reichel (2005) on a study of 100 largest United Kingdom companies was used in this study. These researchers used the following three stages: (1) Grouping companies into distinctive clusters, (2) Sampling one company from each cluster, and (3) Drawing up a sample size from each of

the clusters. This study, therefore, is going to use the steps as used by (Haber and Reichel, 2005) to get raw data from SMEs at Vhembe District Municipality.

3.5.1. Sample size

To determine the sample size, three criteria were followed: (a) minimum sample size to conduct meaningful data analysis, (b) sample sizes used in past research, and (c) cost associated with collecting the information from respondents.

- a) **Data analysis:** To make useful interpretations of results, factor analysis, reliability tests, regression analysis and chi-square tests were conducted. Several these tests stipulate minimum sample sizes, for instance, to run a viable factor analysis.
- b) **Past studies:** Esselaar *et al.* (2007) conducted a study in 13 African countries where 280 small and micro enterprises from each country were surveyed.
- c) **Cost:** As is the case with many master's studies, costs and budgetary constraints affect studies of this nature in several ways. The costs and availability of study grants impact on the types of research problems and topics investigated, methodology selected and the sampling techniques applied (Perry, 1998). The limitations of time and cost also influenced this present study.

Bvumbwe and Thwala (2011); (Plaatjies, 2008; Soeker, 2009), state that the larger the population, the smaller the percentage of that population the sample needs include. Furthermore, if the population itself is relatively small, the sample should comprise a reasonably large percentage of the population (Strydom & De Vos, 1998).

3.6. Data collection

This study used questionnaires as its primary data collection instrument to collect data from 100 SMMEs owners and workers in the Vhembe District Municipality in Limpopo Province of South Africa. The study also uses secondary data from different sources. This is because secondary data tends to compensate for the loopholes of primary data. Secondary data comprises of sources such books, scientific articles, company reports and internet sources as well as government institutions policy strategies and reforms. All sources are in general treated and assessed as of high quality and the diversity of sources and nature of data is in accordance with the multifaceted and holistic approach this study is based on.

3.6.1. The Questionnaire

The data collection instrument consisted of structured questions and scales measuring different aspects pertaining to respondents' demographic characteristics, information about the SMMEs', use of mobile devices and productivity and technology usage in the business.

A questionnaire is a set of fixed-format, self-report items that is completed by respondents at their own pace, often without supervision (Stangor, 2011). As indicated in Chapter 1, the study adapted the questionnaire utilised by (Donner, 2004). Table 3.1 describes the structure of the questionnaire used for data collection for this study.

Table 3.1: Data collection instrument

Section	Questions	Source	Hypotheses
A	Demographics	Developed for this research	N/A
B	Information about the business	Developed for this research	H ₃
C	Use of Digital Technologies	Shambare <i>et al.</i> (2010) Developed for this research	H ₁ , H ₂ , H ₃ ,H ₄ ,H ₅
D	Technology usage in the business	Developed for this research	H ₁ , H ₂ , H ₃ ,H ₄ ,H ₅

In total, the questionnaire was five pages long, comprising of four sections:

Section A: This section of the questionnaire gathers data related to respondents' demographics.

Section B: This section gathers business-related information from the respondents.

Section C: This section is dedicated to soliciting the usage levels of mobile devices.

Section D: Gathers productivity and technology usage related information in the business. A 5-point Likert scale (1 = strongly agree, 2= agree, 3= neutral, 4 = disagree; 5 = strongly disagree, 1= always, 2= often, 3= moderate, 4=seldom, 5= never and 1= strongly satisfactory,

2= satisfactory, 3 = neutral, 4= strongly dissatisfactory and 5 = strongly dissatisfactory) and structured questions were used. A copy of the data collection instrument is provided in the appendices.

3.7. DATA ANALYSIS

All the questionnaires received from respondents were checked for omissions, legibility and consistency. The data was then analysed using descriptive and inferential statistics. The collected data was analysed using IBM SPSS Version 25. Various descriptive and multivariate statistical tests including the reliability tests, chi-square tests and factor analysis were used to analyse the collected data. The following tests were used to perform the following analysis (Field, 2009):

- **Descriptive statistics** - to describe the samples' demography and their mobile marketing profiles, pie charts, percentage, bar graph
- **Chi-square tests** - to establish associations between variables.
- **Reliability analysis** - employing the Cronbach's alpha to evaluate the measure of internal consistency (reliability) of the research instrument (measurement scales).
- **Factor analysis** - to lessen research variables into smaller groups of the latent variable, it is also used as a means of testing validity. Whilst all these tests are essential for data screening and analysis.
- **Simple Regression analysis** - to test the formulated hypotheses and two-way Anova test

3.8. RESEARCH ETHICS CONSIDERATIONS

To protect research respondents from any potential adverse impact arising from this study, the researcher study followed regulations and procedures specified by the University of Venda Research Ethics Committee. To uphold high standards of ethics, the following measures were implemented:

- i. Informed consent – research participants were advised of the nature of their involvement in the research beforehand. Research assistants explained to all respondents faithfully what they were required to do and their rights as participants in the research, such as their right to pull out from participation at any phase of the

research. After this, all respondents' consent was required and protected before the commencement of any survey.

- ii. Right to privacy – the personal information of respondents and their sentiments were treated confidentially. Respondents were reminded not to supply details about their self and any other evidence that might indicate their identities.
- iii. Dignity - the dignity and character of all participants were upheld and not be exposed to uncomfortable behaviour.
- iv. Honesty – Results of the study are outlined honestly even when results turned out to be contrary or different from the researcher's hypotheses. Moreover, studies other than the researchers were properly cited.

3.9. Chapter Summary

Chapter 3, the Research Methodology, has provided the methodology used in this study. The study adopted quantitative research methods. This method has been extensively described and justified throughout this chapter. The following chapter presents the findings that emerged from the data analysis.

CHAPTER FOUR: DATA ANALYSIS AND RESULTS

4.1. INTRODUCTION

The data was captured in Microsoft excel and then exported to IBM SPSS V25 for analysis using both descriptive and inferential statistics. To address the objectives for this study, data was analysed using tables and graphs to gain insight on the trends and relationships in the data. The demographic and marketing profiles of the respondents were then manipulated. In addition, factor analysis was conducted to screen out those research variables that were not suitable for regression analysis. The rest of this chapter is presented as follows: demographic characteristics of respondents, followed by factor analysis, then multiple regression analysis and finally a chapter summary winds-up the chapter.

4.2. DEMOGRAPHIC

The following section presents data pertaining age distribution, gender and level of education.

4.2.1. Age distribution

The descriptive statistics were done to describe the sample' demographic characteristics and their mobile profiles. The age distribution of the respondents is presented on Figure 4.1.:

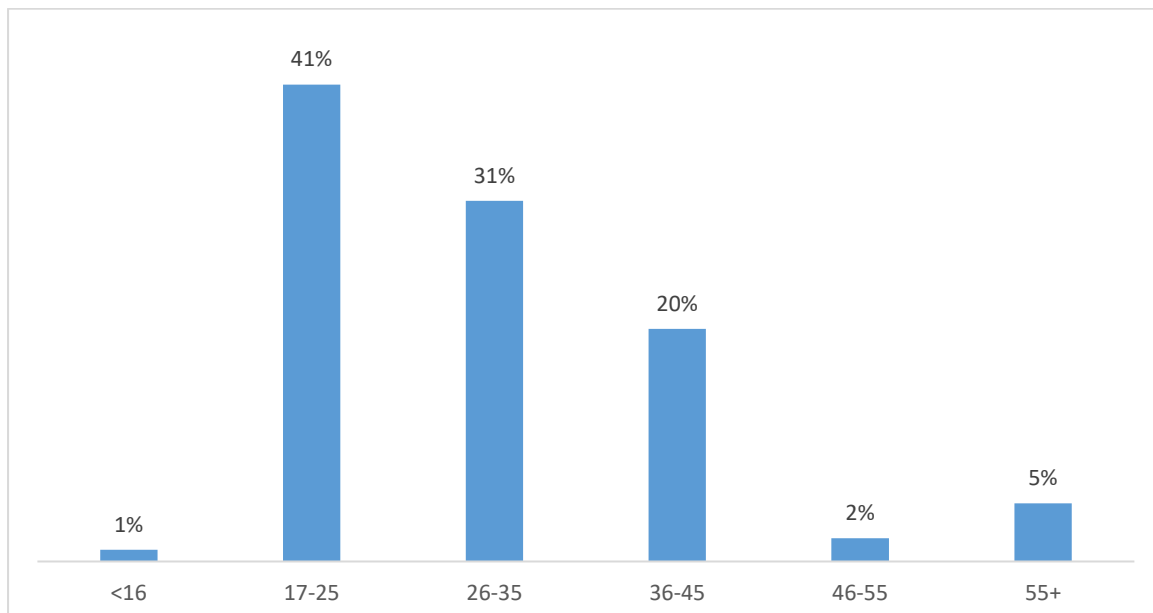


Figure 4.1: Age of respondents

Figure 4.1 shows that the majority (41%) of the respondents are in the age group 17 to 25 years old, followed by the age group 26 to 35 years accounting for 31% of the respondents,

followed by those in the age group 36 to 45 accounting for 20% of the sample, followed by respondents in the 55 and above age category accounting for 5% then the 46 to 55 age group and the 16 and below accounting for 2% and 1% respectively. This finding shows that most of the respondents fell in the 17 to 25 years' age group.

4.2.2. Gender

Figure 4.2 shows the gender distribution of respondents whose majority accounting for (61%) were males while female accounted the remaining 39% of the respondents.

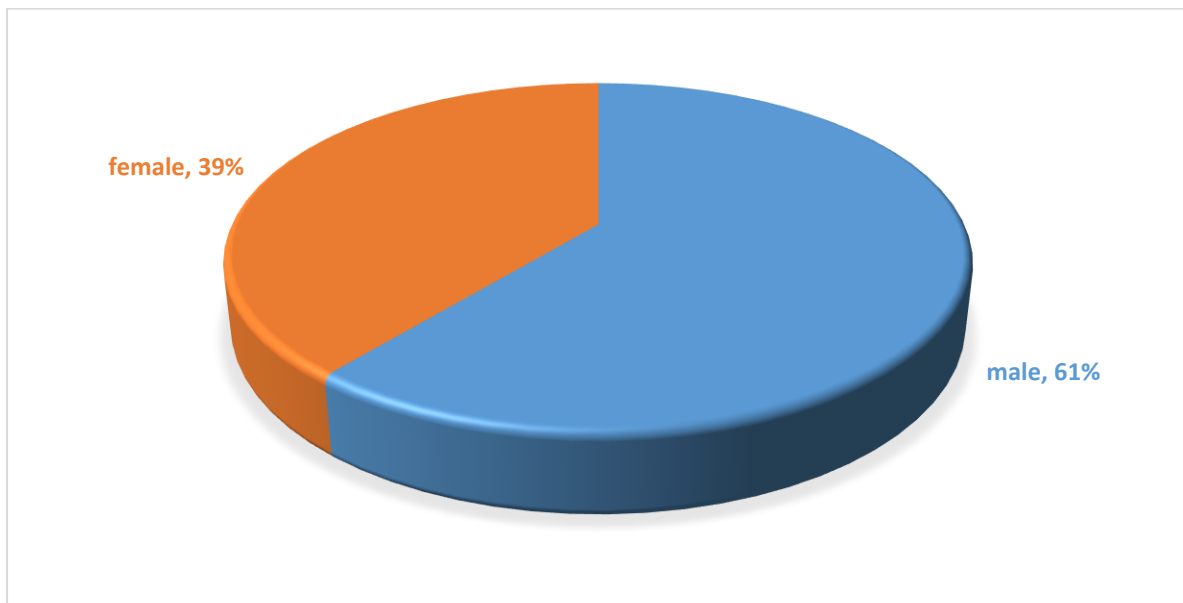


Figure 4.2: Gender distribution

4.2.3. Level of Education

The highest level of education attained by respondents was investigated. The results shows that the majority (48%) of respondents had a university degree, followed by respondents with matric or high school accounting for 29% of the entire sample. This means that most respondents were literate. Respondents with an honour's degree accounted for 10%, while 8% had a postgraduate degree. Therefore, diploma and degree holders were the dominant respondents.

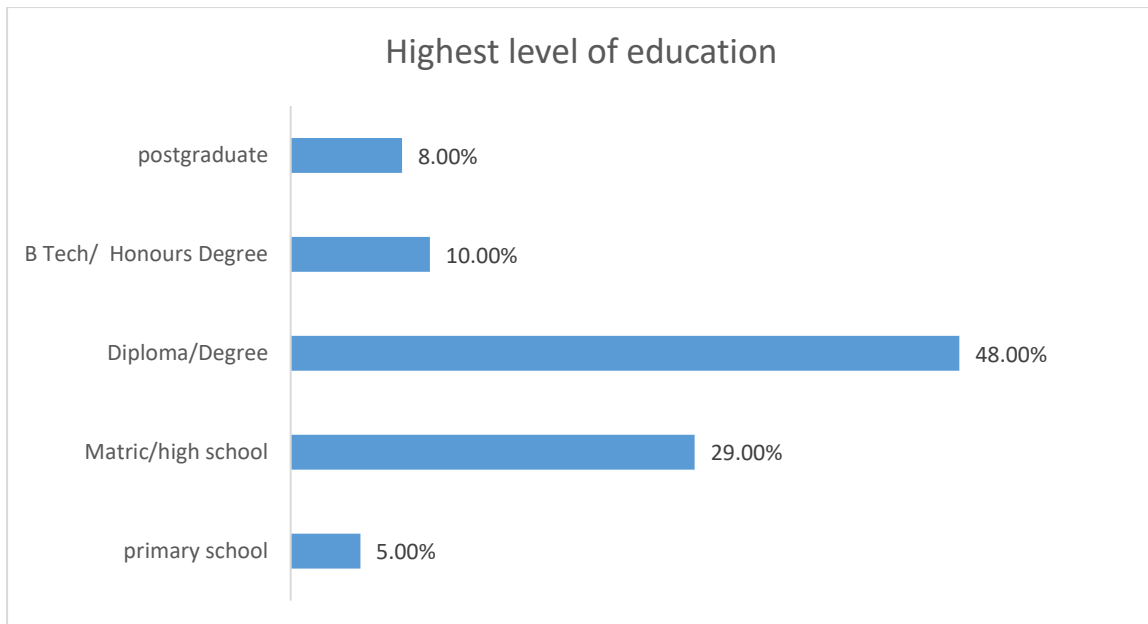


Figure 4.3: Highest level of education

4.2.4. Type of business owned

Figure 4.4 illustrates the different types of businesses owned by respondents. The majority (41%) of the respondents own private companies, 18% own close corporation, 22% own partnership businesses and 19% own sole trading businesses. Thus, the results reveal that most the respondents own a private company while sole traders were the least numbers.

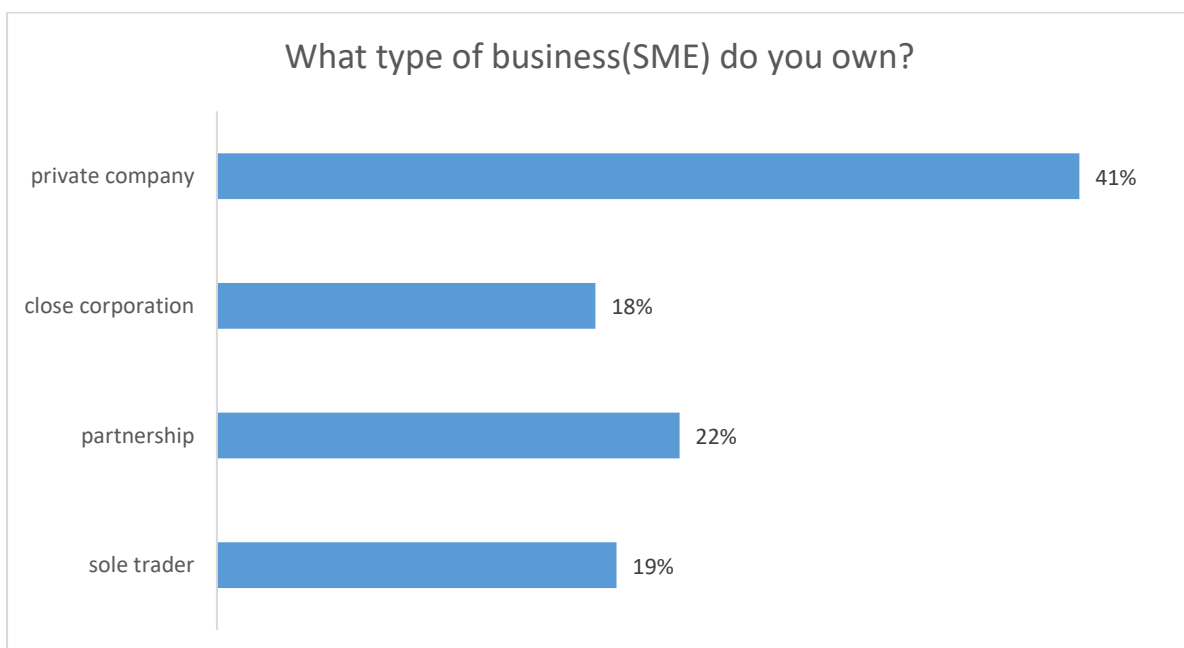


Figure 4.4: What type of business (SME) do you own?

4.3. Business information

The basic business information about the SMEs owners was investigated as shown in the Table 4.1.

Table 4.1: Business information about the SMEs

Variable		Count	Percentage
How long has your SME been operating?	< 1 year	25	25
	1 year	22	22
	2 year	16	16
	3 year	18	18
	4 years +	19	19
How many employees do you have?	One	35	35
	Two	21	21
	Three	28	28
	Four	1	1
	Five +	15	15
How many other businesses do you own	Tavern	10	10.0
	Taxi/Buses	3	3.0
	B&B	12	12.0
	none	46	46.0
	other	16	16.0
	Spaza	2	2.0
	Herbal shop	3	3.0
	Property investment	3	3.0
	Salon	2	2.0
	Retail and wholesale	2	2.0
	Law firm	1	1.0
Do you have a business bank account?	yes	82	82.0
	no	18	18.0
Which banking services do you use for your business?	Cell phone banking	50	50.0
	Internet banking	34	34.0
	ATM	14	14.0
	Cheque book	2	2.0

Table 4.1 shows business information about SMEs owned by respondents. The results show that only 19% of the respondents have been operating for more than 4 years, 18% have been operating for 3 years, 16% have been operating for 2 years, and 22% of the respondents have been in business for a year while 25% have been in operational for less than a year. The majority (35%) of these SMEs have one employee, 21% of the respondents have two employees, 28% indicated that they have three employees, only 1% indicated that they have four employees and 15% indicated that they have more than 5 employees. Nearly half (46%) of the respondents do not own other business. It was identified that 10% of the respondents owns tavern, 3% owns taxi/bus, 12% are in the bed and breakfast (B&B) business, 16% owns other businesses not specified, 2% are also in the spaza business, 3% are also in property investments, 2% are in the retail and wholesale industry and 1% owns a Law firm. The majority (82%) of the respondents had a business bank account, only 50% uses cell phone banking, 34% uses internet banking, 14% uses ATM, and 2% uses cheque book.

4.3.1. Use of digital technology

Table 4.2: Use of digital technologies

Variables		Count	Percentage
Do you own any Digital Technology?	Yes	79	79.0
	No	21	21.0
If you answer yes in Q10, what type of digital technology do you own?	smartphone, tablet, laptop	14	14.0
	cell phone	29	29.0
	all the above	14	14.0
	smart phone	26	26.0
	Laptop	5	5.0
	cell phone and laptop	5	5.0
	cell phone, smartphone and laptop	6	6.0
	iPad and laptop	1	1.0
Do you use any of the above-mentioned technology for business purposes?	Yes	76	76.0
	No	24	24.0

Continued from last page

If you answer yes in Q12? How do you use them?	to place order	29	29.0
	to receive orders	7	7.0
	customer relations	16	16.0
	Other	8	8.0
	all the above	16	16.0
	to communicate with suppliers	21	21.0
	Marketing	3	3.0
If you answer NO in Q12, what were your reasons?	lack of knowledge	11	11.0
	complicated to use the device for business	20	20.0
	cannot afford to buy one	10	10.0
	expensive to load airtime	3	3.0
	Other	1	1.0
	Uses the above-mentioned technology	55	55.0

The majority (79%) of the respondents own digital technology, whereas 14% indicated that they own either a smartphone, tablet or laptop. 29% owns a cell phone only, 14% owns all (smartphone, tablet and laptop), 26% owns smartphone, 5% owns laptop, 5% owns laptop and cell phone, and 1% own an iPad and a laptop. Only 6% owns smartphone, cell phone and laptop. The findings show that 76% business uses digital technology as tools for, placing orders due to 29% of the respondents, 7% mentioned that the technology is used to receive orders, 16% uses the technology to create and maintain customer relations, while 8% uses these devices for other purpose not specified. Subsequently, 21% of the respondents mentioned that the technology is to communicate with suppliers and 3% market using the technology. However, 11% of the respondents indicated that they have insufficient knowledge to use the technology for other business purpose, 20% incited that it is complicated to use the devices, 10% specified that the devices are not affordable, 3% are of the view that it is expensive to load airtime while 55% did not specified (they are using the devices).

4.4. FACTOR ANALYSIS

The data was subject to analysis using factor analysis based on extraction, using principal axis factoring with a varimax rotation. Five factors were obtained using the criterion that factors associated with eigenvalues greater than 1 were retained.

4.4.1. Kaiser-Meyer-Olkin Measure (KMO) and Bartlett's test

The Kaiser-Meyer-Olkin measure (KMO) and Bartlett's test were performed as illustrated in Table 4.3 to assess the suitability of the data for factor analysis. From Table 4.3 it can be deduced that the data is suitable for factor analysis, since the KMO measure of sampling adequacy is 0.821 (which is excellent) and statistically significant (sig=0.000). A Chi-Square value of 2474.930 was obtained with a degree of freedom of 325 that is significant (i.e. $p = 0.000$). This finding demonstrates that the results are suitable for regression analysis.

Table 4.3: KMO and Bartlett's

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.821
Bartlett's Test of Sphericity	Approx. Chi-Square	2474.930
	df	325
	Sig.	0.000

4.4.2. Total variance explained

The principal component analysis was the extraction method used in this test. As illustrated in Table 4.4, there were 26 variables, each of which has been standardised to have a variance of 1. So, the total variance is 26, the first component is the linear combination of the 26 variables that has the largest variance. The second component is the linear combination of the 26 variables that has the next largest variance, the third has the next largest variance and so on. The sixth through twenty-sixth eigenvalues are all substantially less than 1 that is why they are not extracted.

Table 4.4: Total variance explained

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.063	42.551	42.551	11.063	42.551	42.551	6.032	23.198	23.198
2	2.482	9.544	52.096	2.482	9.544	52.096	5.525	21.249	44.447
3	2.213	8.510	60.606	2.213	8.510	60.606	3.495	13.441	57.888
4	1.589	6.113	66.718	1.589	6.113	66.718	2.276	8.755	66.643
5	1.134	4.363	71.082	1.134	4.363	71.082	1.154	4.439	71.082
6	0.981	3.772	74.853						
7	0.953	3.664	78.518						
8	0.819	3.149	81.667						
9	0.727	2.794	84.461						

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10	0.656	2.521	86.983						
11	0.525	2.020	89.002						
12	0.452	1.740	90.742						
13	0.416	1.599	92.341						
14	0.353	1.356	93.697						
15	0.340	1.309	95.005						
16	0.266	1.024	96.029						
17	0.182	0.701	96.730						
18	0.171	0.656	97.386						
19	0.149	0.572	97.958						
20	0.115	0.442	98.401						
21	0.110	0.422	98.823						
22	0.097	0.374	99.196						
23	0.082	0.315	99.511						
24	0.071	0.272	99.784						
25	0.052	0.199	99.982						
26	0.005	0.018	100.000						
Extraction Method: Principal Component Analysis.									

Furthermore, principal component analysis was done to test common method bias using Harman's single factor test. The rule of thumb according to Harman 1 factor test is that the variance of the first extracted component should be less than 50% to demonstrate the absence of common methods bias (i.e. the probability of errors arising in data gathering due to the way in which the data gathering instruments were designed). As illustrated in Table 4.4 only 42.551% of the total variance was extracted when the first component was extracted. This implies that the remaining factor i.e. 57.449% explains the unextracted factors (Munyoka, 2019). This shows that common methods bias was not a problem in this study.

4.4.3. Scree plot

The scree plot in Figure 4.5 shows the eigenvalues for the first through to twenty-sixth components.

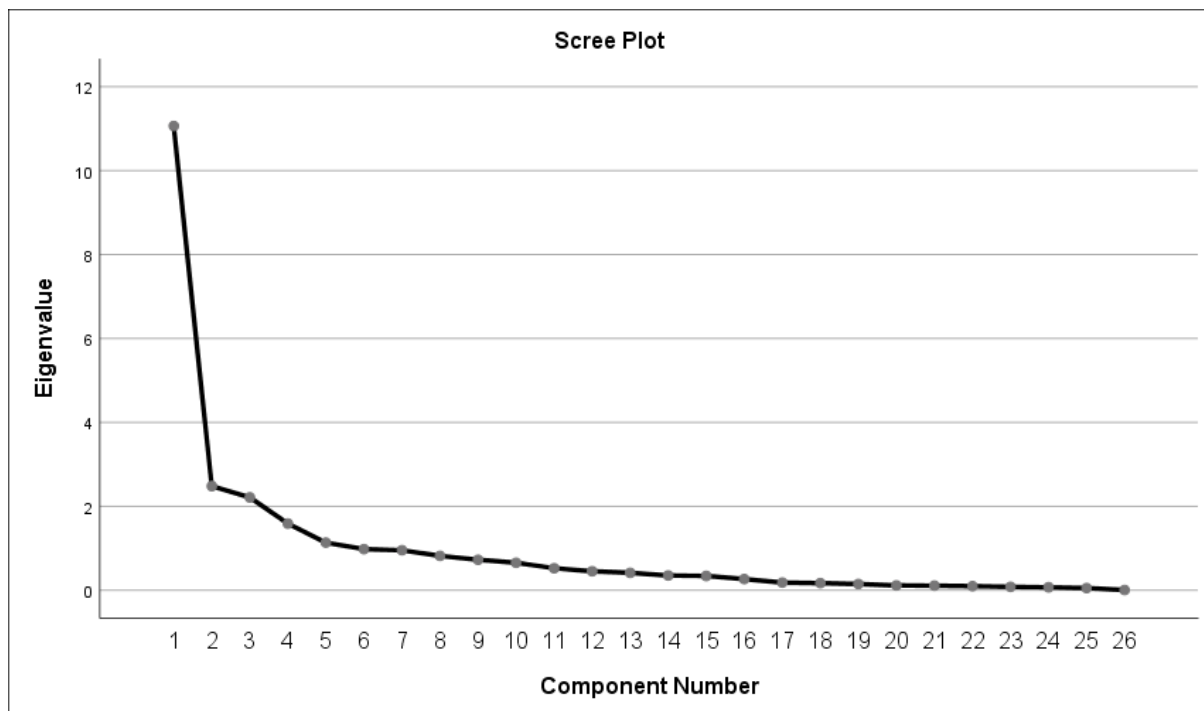


Figure 4.5: Scree plot

It was observed that there was a distinct break between the first five factors and others. A scree plot illustrates the visualisation of eigen values (factors become stronger as the eigen value increase above 1 and weak otherwise). It can be deduced that the first five components have eigenvalues greater than 1, which implies that the five factors are strong. The sixth component and onwards drop off dramatically.

4.4.4. Component matrix

Table 4.5 illustrates component loadings, which are the correlations between the variables and components.

Table 4.5: Component matrix

	Component				
	1	2	3	4	5
My business is easier now that I use digital technologies	0.807	-0.252	-0.150	-0.148	0.033
My family has more money because of the usage of digital technologies in my business	0.487	0.266	0.282	-0.297	0.422
Digital technology saves me time	0.769	-0.291	-0.170	-0.120	-0.004
Digital technology lets me get more done during the day	0.765	-0.350	-0.115	-0.172	-0.081
Digital technologies help my business save money	0.676	0.081	0.023	-0.346	0.138
My customer's satisfaction improved since the use of digital technologies	0.718	-0.162	-0.168	-0.181	0.287
My revenue increased after using digital technologies	0.132	-0.266	0.927	-0.060	-0.065
My operations cost has been reduced after using digital technologies	0.656	-0.296	-0.184	-0.432	-0.015
Using digital technologies has positively influenced my revenue	0.122	-0.279	0.926	-0.059	-0.083
I use digital technologies to stay in touch with my customers	0.699	-0.287	-0.094	-0.190	-0.004
I use digital technology to stay in touch with my suppliers	0.560	-0.263	-0.084	-0.207	0.074
Digital technologies give me access to new customers	0.816	-0.278	0.051	0.282	-0.003
I use digital technologies to stay in touch with my family	0.659	0.398	0.085	-0.128	0.076
Digital technology helps me to come and go without worrying about missed calls	0.559	0.578	0.047	0.219	-0.122
I use digital technology to stay in touch with my friends	0.585	0.461	0.427	-0.105	0.101
Digital technology helps me find work	0.669	0.321	-0.080	-0.034	0.088
Digital technologies help me keep informed about prices in my business	0.773	0.201	0.025	-0.105	-0.106

Continued from last page

Using digital technologies changed the way I do business.	0.833	0.218	-0.034	0.121	-0.091
I am interested in learning about new features of digital technologies	0.813	-0.181	0.094	0.208	-0.164
I can't do business without digital technology	0.412	0.437	-0.125	0.032	-0.173
I was among the first of my friends and business associates to use digital technology	0.094	-0.014	0.003	0.305	0.794
I use digital technologies for business more than social calls	0.718	0.390	-0.111	0.093	-0.069
Digital technology gives me more control over who I talk to, and how/when I talk to them	0.687	0.408	0.146	0.167	-0.079
How often do you use digital technologies in your business?	0.820	-0.246	-0.102	0.355	-0.098
How would you rate the level of your customer's satisfaction with your service	0.740	-0.309	0.014	0.376	-0.087
How would you rate the level of complaints from your customers	0.466	-0.224	0.048	0.622	0.240

Extraction Method: Principal Component Analysis.

^a. 5 components extracted.

The factor loading as shown in Table 4.5, shows that the first factor loads positively on all the variables. The second factor tends to differentiate between variables 1, 3, 4, 6, 7, 8, 9, 10, 11, 18, 20, 23, 24, 25 and 2, 5, 12, 13, 14, 15, 16, 17, 19, 21, 22, 26. The same applies to the third, fourth and fifth factors as they differ between variables, that is, some are negative while some are positive. This implies that a two-factor solution was more appropriate.

4.4.5. Communalities

The communalities shown in Table 4.6 in the extraction column are the proportion of the variance in each of the original 26 variables retained by keeping only 5 factors.

Table 4.6: Communalities

	Initial	Extraction
My business is easier now that I use digital technologies	1.000	0.761
My family has more money because of the usage of digital technologies in my business	1.000	0.654
Digital technology saves me time	1.000	0.719
Digital technology lets me get more done during the day	1.000	0.756
Digital technologies help my business save money	1.000	0.602
My customer's satisfaction improved since the use of digital technologies	1.000	0.686
My revenue increased after using digital technologies	1.000	0.955
My operations cost has been reduced after using digital technologies	1.000	0.739
Using digital technologies has positively influenced my revenue	1.000	0.961
I use digital technologies to stay in touch with my customers	1.000	0.616
I use digital technology to stay in touch with my suppliers	1.000	0.438
Digital technologies give me access to new customers	1.000	0.826
I use digital technologies to stay in touch with my family	1.000	0.622
Digital technology helps me to come and go without worrying about missed calls	1.000	0.711
I use digital technology to stay in touch with my friends	1.000	0.758
Digital technology helps me find work	1.000	0.566
Digital technologies help me keep informed about prices in my business	1.000	0.661
Using digital technologies changed the way I do business	1.000	0.765
I am interested in learning about new features of digital technologies	1.000	0.772
I can't do business without digital technology	1.000	0.407
I was among the first of my friends and business associates to use digital technology	1.000	0.732
I use digital technologies for business more than social calls	1.000	0.693
Digital technology gives me more control over who I talk to, and how/when I talk to them	1.000	0.694
How often do you use digital technologies in your business?	1.000	0.879
How would you rate the level of your customer's satisfaction with your service	1.000	0.793
How would you rate the level of complaints from your customers	1.000	0.715

Extraction Method: Principal Component Analysis.

The first column contains initial estimates based on the factoring method (see Table 4.6). All the 26 variables are well represented by the five factors, with variable “I can't do business without digital technology” having the smallest communality value of 0.407.

4.5. MULTIPLE REGRESSION ANALYSIS

Multiple linear regression was done to assess the effect of usage, information and connectivity on production and revenue (Hair et al., 2018).

4.5.1. Model summary for revenue

Table 4.7: Model summary for revenue

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					Change	F	df1	df2	Sig.
1	0.217 ^a	0.047	0.017	4.84066	0.047	1.581	3	96	0.199

a. Predicts: (Constant), Usage, Information, Connectivity

Table 4.7 illustrate information about the correlation between the dependent variable revenue and independent variables (usage, information and connectivity on revenue.); where $R=0.217$ indicating that there is a positive but weak relationship between the revenue and the independent variables combined. This implies that the increase in connectivity, usage and information result in the increase in revenue.

4.5.2. Coefficients of the model

Table 4.8: Coefficients of the revenue model

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	0.816	1.253			0.651	0.516
Connectivity	1.539	0.776	0.285		1.982	0.050
Information	-0.411	0.564	-0.104		-0.729	0.468
Usage	-0.103	0.244	-0.044		-0.422	0.674

a. Dependent Variable: Revenue

In Table 4.8, results of the two-sided hypothesis test are provided based on theoretical slope of the regression line for predicting revenue from usage, information and connectivity. The regression equation for predicting revenue is:

$$\text{Revenue} = 0.86 + 1.539(\text{Connectivity}) - 0.411(\text{information}) - 0.103(\text{usage}).$$

Connectivity was statistically significant with p-value = 0.05 and a beta value of $\beta = 0.285$ and a t-value of 1.982, which is above the recommended 1.96 (Hair, Black, Babin & Anderson, 2018). Thus, for the revenue model only the connectivity variable was significant while information and usage were not significant.

4.5.3. Model summary for productivity

Table 4.9: Model summary for productivity

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					Change	F	df1	df2	Sig.
1	0.765 ^a	0.585	0.572	0.70477	0.585	45.024	3	96	0.000

a. Predicts: (Constant), Usage, Information, Connectivity

The model summary (Table 4.9) provides information about the correlations between productivity and usage, information and connectivity. As indicated in Table 4.9 an adjusted R-Square value of 0.572 was obtained and significant (i.e. $p = 0.000$). Where $R = 0.765$ indicating that there is strong positive relationship between the dependent variable and independent variables. Furthermore, the p-value = 0.000 implies that the relationship is statistically significant.

4.5.4. Coefficients for a productivity model

Table 4.10: Productivity Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	0.540	0.182		2.958	0.004
Connectivity	0.714	0.113	0.601	6.320	0.000
Information	0.173	0.082	0.199	2.114	0.037
Usage	0.015	0.036	0.029	0.419	0.676

a. Dependent Variable: Productivity

Table 4.10 shows that information and connectivity variables have positive effects on productivity, while usage does not. This is supported by the positive coefficients of each independent variables which are all statistically significant except for usage. Hence, the regression equation formulated is:

Productivity = 0.54 + 0.714 (Connectivity) + 0.173 (Information) + 0.0153 (Usage). Therefore, connectivity had a Beta value of $\beta = 0.601$, p-value = 0.000 and a t-value of 6.320, which is above the recommended 1.96. Similarly, the information variable was significant ($p = 0.037$) with $\beta = 0.199$ and $t = 2.114$, which is above the rule of thumb (1.96). Furthermore, the Usage variable had $t = 0.419$, a $\beta = 0.029$ which are not significant (i.e. $p = 0.676$ and greater than the recommended 0.05 value).

4.6. HYPOTHESES TESTING

To test the formulated hypotheses, linear regression analysis was utilised. This meant testing the relationship between dependent and independent variables as well as their significance. A total of five dependent variables (i.e. productivity, revenue and operating costs, connectivity, information and customer satisfaction) were identified as being affected by the continued usage of digital technologies. Thus, the linear regression model: $y = a + bx + e$ was individually applied to test each dependent variable with the independent variable (usage of mobile devices). The regression model consists of:

- (a) Y = Dependent variable
- (b) X = Independent variable
- (c) a = Y-axis intercept
- (d) b = Beta or the coefficient of X (independent variable)
- (e) e = Error term

So, the value of beta indicates whether the dependent and independent variables are positively or negatively related. In other words, when the independent variable increases, at what rate would the dependent variable increase? As a corollary, a positive beta indicates a positive relationship and the converse is also true. The p-value was used to assess the significance of the beta score. A significant relationship is a p-value less than 0.05. If the p-value was observed to be greater than 0.05, then the relationship was found to be non-significant. After determining a favourable p-value, the R-square was used to depict the strength of the relationship. The higher the R-square, the stronger the relationship; and then a lower R-square depicted a weak relationship.

4.6.1. Hypothesis 1

The rationale of this hypothesis was to test the relationship between access to digital technology and productivity, as well as to discover the impact of digital technology usage on the productivity output of the business. The data indicates that having access to digital technologies makes a significant contribution in increasing the production output of the business.

Table 4.11: Productivity

Independent variable	Alpha	Beta	R	R-square	P
Productivity	.752	.540	.0765	.585	.000

The p-value is .000 and this means that the relationship between the two variables is positive and significant. The R-square is .585, meaning the relationship is positive (see Table 4.11).

Conclusion on H₁: Hypothesis accepted

4.6.2. Hypothesis 2

The rationale of the hypothesis was to test the relationship between access to digital technology and the level of information acquisition. Furthermore, the study investigates the impact of digital technology usage on the level of information. The data indicates that having access to digital technologies increases the chances of businesses obtaining new information on factors such as prices and expansions.

Table 4.12: Information

Independent variable	Alpha	Beta	R	R-square	P
Information	.390	.760	.810	.642	.000

The p-value is .000 and this means that the relationship between the two variables is positive and significant. The R-square is .642, meaning the relationship is positive (see Table 4.12).

Conclusion on H₂: Hypothesis accepted

4.6.3. Hypothesis 3

Hypothesis 3 tested the relationship between access to digital technology and revenue and to establish the effect of digital technology usage on SME output. The results indicate that having access to digital technologies increases the chances of SMEs to increase their revenue and produce more productive outputs.

Table 4.13: Revenue and SME output

Independent variable	Alpha	Beta	R	R-square	P
Revenue & SME output	.797	.799	.861	.689	.000

Therefore, a p-value of 0.000 was established and this means that the relationship between the two variables is positive and significant. The R-square is .689, meaning the relationship is positive (see Table 4.13).

Conclusion on H₃: Hypothesis accepted

4.6.4. Hypothesis 4

The rationale of the hypothesis was to test the relationship between access to digital technologies and management support. The findings indicate that having access to digital technologies coupled with management support makes a significant contribution to the profitability of the business.

Table 4.14: Management support

Independent variable	Alpha	Beta	R	R-square	P
Connectivity	.787	.626	.724	.525	.000

The beta value for the relationship between access to digital technologies and management support is 0.626, which is significant with a p-value of 0.000. This means that the relationship between the two variables is positive. The R-square is 0.525, meaning the relationship is also positive (see Table 4.14).

Conclusion on H₄: Hypothesis accepted

4.6.5. Hypothesis 5

Hypothesis 5 tested the relationship between access to digital technologies and connectivity and to ascertain the influence of having access to digital technologies on the level of connectivity with stakeholders, such as the government, customers and business associates. The results show that having access to digital technologies make a significant contribution to the level of connectivity with stakeholders.

Table 4.15: Connectivity

Independent variable	Alpha	Beta	R	R-square	P
Customer satisfaction	1.394	.524	.392	.154	.000

Regarding hypothesis 5, a beta value of 0.524 was established on the relationship between access to digital technologies and connectivity with a significant p-value of 0.000 and this means that the relationship between the two variables is positive. The R-square is .154, meaning the relationship is positive (see Table 4.15).

Conclusion on H₅: Hypothesis accepted

4.7. CHAPTER SUMMARY

This chapter presents data analysis in the form of descriptive statistics and inferential statistics. The analysis started by exploring demographic characteristics, followed by business information and the use of digital technology using descriptive statistics techniques. A follow up analysis of inferential statistics using factor analysis technique was conducted to reduce a large set of variables by presenting the data using a smaller set of relevant factors. Twenty-six items relevant to the use of digital technology and business information were found suitable for factor analysis using SPSS V25. Prior to performing factor analysis, the suitability of data was assessed. Inspection of the correlation matrix revealed the presence of many coefficient 0.4 and above. The Kaiser-Meyer-Olkin was used to assess factorability of the correlation

matrix. The factor analysis revealed the presence of five components with eigenvalue greater than 1. The next chapter (5) presents the discussion of the findings and recommendations of this study.

CHAPTER FIVE: FINDINGS AND CONCLUSIONS

5.1. CHAPTER OVERVIEW

This chapter provides a discussion of the finding, recommendations and conclusions. Furthermore, the limitations of the study and suggestions for future research is provided.

5.2. INTRODUCTION

As outlined in Chapter 1, the aim of this study was to investigate the impact of digital technology on growing SMMEs in Vhembe District Municipality paying attention on how digital technologies improve their competitiveness and business performance in the face of this rapidly changing and globalised world. To achieve this aim, five hypotheses were formulated and tested using data collected from 100 SMMEs owners and workers Vhembe District Municipality.

5.3. SUMMARY OF FINDINGS

The following were observed from the data analysed:

5.3.1. SMEs in the emerging towns are associated with socio-economic development

Findings from other studies corroborate with this study's findings revealing evidence suggesting that SMEs in Vhembe District Municipality play an important role in socio-economic development (Donner, 2006; Good & Qureshi, 2009). The contributions of SMEs were found to be in the areas of:

- (a) **Skills development:** To manage a small business effectively, entrepreneurs need to apply functions of management, such as marketing, purchasing, human resources and financial functions. Several management skills such as communication skills (listening, verbal, written), analytical and research skills, computer and technical literacy, flexibility, adaptability, managing multiple priorities and interpersonal abilities are required. SMEs owners in Vhembe District have acquired some of these skills since the success rate is relatively high as indicated in the findings in chapter four.
- (b) **Job creation and income generation:** In general, there is limited access to jobs, particularly for youth and older people without tertiary education in Vhembe District. Old and young people without tertiary education participate in operating SMEs. SMEs

create alternative sources of income not only for the entrepreneurs, but also for the community in terms of employment. The results indicate that entrepreneurs employ more than one employee with about 15% of entrepreneurs employing 5 or more employees. Clearly, this translates to a significant contribution to job creation in Vhembe District Municipality.

5.3.2. Usage patterns of digital technologies

Findings of this study indicate that most of the respondents (approximately 79%) owned digital technology. These findings are in accordance with other studies conducted in other African countries (Adamczewski, 2016). For this study, digital technologies referred to mobile phones, smartphones, tablets, iPads and laptops. Results show that mobile phones remain the most commonly used digital technologies among SMEs (see Table 4.2). Authors scholars such as (Deen-Swarray, Moyo, & Stork, 2013; Donner, 2006), have also found that mobile phones are the most commonly used mobile devices to support informal businesses. However, Molony (2006) argues that even though mobile phones are increasingly being used in the informal sector, a lot of business still relies on face-to-face contact.

On the other hand, few respondents did not use digital technologies for the following reasons: lack of knowledge, affordability and lack of access to these technologies. These results are consistent with the findings by (Deen-Swarray et al., 2013; Rashid & Elder, 2009). Findings from this study indicate that SMEs owners in Vhembe District Municipality do apply digital technologies in their businesses. In addition, these digital technologies, have positive impact on productivity, revenue, operating costs, obtaining new information, finding new business and customer satisfaction.

5.4. RESEARCH OBJECTIVES REVISTED

The following results answered the research objectives in section 1.5, Chapter 1: it was found that the use of digital technologies increases productivity, reduces the cost of doing business in terms of transportation costs and enables businesses to access new markets and business information. With the current use of mobile devices such as smartphones, tablets and iPads, businesses can obtain any information on the Internet, such as prices, online shopping and business trends. Furthermore, digital technologies enable businesses to place orders with suppliers, thus, saving them time and transport costs when buying stock at the wholesaler. Some businesses make use of this technology to receive orders from customers, which

creates an advantage for them since the customer does not have to wait for service on arrival at the SME premises. It was also found that some businesses make use of digital technologies to build supplier and customer relationships, thus increasing the levels of customer satisfaction as well as trust with suppliers. The results indicate that few businesses make use of this technology for banking services such as mobile phone banking and Internet banking. This saves them time because they do not physically have to go to the bank. Those who do not have reliable employees might have to close the SME to go to the bank. Thus, digital technologies enable these businesses to gain a competitive advantage which increases the profitability of the business.

5.5. RESEARCH PROBLEM AND QUESTION

To fully address the research problem in Chapter 1, a quantitative method was used to collect primary data from 100 SMEs shop owners in Vhembe District Municipality. The findings from the evidence collected in this study suggests that the usage of mobile device technologies among Vhembe District SMEs is quite high (see chapter 4). Furthermore, the findings indicate that these technologies are used mostly for communicating with suppliers and to some extent with customers. The usage patterns include placing orders from suppliers, receiving orders from customers and building supplier and customer relationships.

In addition, the hypotheses were tested, and the findings are presented in Table 5.1:

Table 5.1: Summary of Hypotheses Testing

Hypotheses	Beta Value	Sig. (p-value)	Hypothesis Accepted/Not?
<i>H₁: Access to digital technologies positively influence SMMEs' performance (overall performance).</i>	0.540	0.000	Accepted
<i>H₂: Access to digital technology services (current information) positively influence SMMEs' performance</i>	0.60	0.000	Accepted
<i>H₃: High digital technology user-skills influence SMMEs' performance</i>	0.799	0.000	Accepted
<i>H₄: Management support for digital technology use influence SMMEs' performance</i>	0.626	0.000	Accepted

H₅: Government policy on digital technology positively influence SMMEs' performance. 0.524 0.000 Accepted

Therefore, findings from the evidence collected in this study suggest that digital technologies contribute significantly in assisting SMEs in enhancing their profit and thus gaining competitive advantage. The results also provide further empirical evidence within the body of knowledge regarding this phenomenon.

5.6. LIMITATIONS OF THE STUDY

This dissertation is subject to some limitations. However, as suggested by (Babbie & Mouton, 2010), limitations do not make a research study weak. The following are some limitations of this study:

- (a) Budget and time constraints were imposed on this study.
- (b) The scope of the study was restricted to Vhembe District Municipality, and therefore findings might not be generalizable to other settings.

5.7. RECOMMENDATIONS

Most SMEEs have limited resources (for example capital) to acquire and utilise digital technologies in their businesses. Therefore, money cannot be wasted on expensive gadgets that take long to make returns but only technologies that add value (i.e. bring profit in short term) can be used. There is the need to be concerned with creating a business environment that allows informal businesses that have the skills and ambition to grow and become formal and sustainable. Digital technologies have the potential to facilitate this. Doing business over distance could become more affordable through the mobile devices as indicated in the literature review of this study. Policy makers have many choices in addressing affordability and access to digital technologies in the informal sector, ranging from introducing competition and removing import duties on prepaid airtime, to supporting mobile application development for informal businesses in general.

5.8. DIRECTIONS FOR FUTURE RESEARCH

To address the gaps within the body of knowledge that remain after this study on the phenomena of digital technology application in the informal sector, the following areas are suggested for further research:

1. Qualitative studies using interviews would enable respondents to give their opinions and suggestions regarding their lived experiences with the use of digital technologies in the informal sector – this would enrich the findings through method triangulation to the findings.
2. Establish whether digital technologies allow for a deepening of the distribution and procurement channels within the informal businesses

5.9. CONCLUSION

This chapter provides the conclusions of the study. The research problem was resolved, and the contribution of the study was indicated by means of hypotheses tested. The limitations of the study and areas for future research were also presented in this chapter. The literature on digital technologies, particularly mobile phones and their impact on informal businesses give credibility to the importance of the technology in boosting socio-economic development activities. The contributions of digital technologies to SMEs have been illustrated in this study and add to the emerging empirical evidence on their impact on profitability and competitive advantage of such businesses. Findings were summarised and provided from the data collected and analysed, which indicate that SMEs shop owners in Vhembe District Municipality make use of digital technology in their businesses. It was observed that digital technology has a significant impact in terms of productivity output, increasing revenue and minimising operating costs, increasing the level of new information acquisition, finding new business and having a positive influence on customer satisfaction.

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APPENDICES

APPENDIX 1: SURVEY QUESTIONNAIRE AND COVER LETTER
SCHOOL OF MANAGEMENT SCIENCES
DEPARTMENT OF BUSINESS INFORMATION SYSTEMS
COVER LETTER

Dear Sir/Madam

My name is MUTOBVU MPHONGA RONALD, a master's student at the University of Venda, Limpopo, South Africa, in the School of Management Sciences, Department of Business Information Systems. I am conducting a study to investigate the "impact of digital technologies on small and medium enterprises in the emerging towns: a case study of Vhembe District Municipality, South Africa". Your voluntary participation is valuable to the successful completion of this study and all the information you are going to provide in this questionnaire is going to be treated with great confidentiality, professionalism and used solely for this study and nothing else. I would greatly appreciate your input and if you could complete all the questions as instructed in the questionnaire. Generally, the questionnaires should take at most fifteen minutes of your valuable time. When completing the questionnaire, the researcher is requesting you to give your honest opinion.

Finally, I respectfully thank you in advance for your generous participation and assistance through completing this questionnaire.

Yours sincerely,

Mutobvu Mpho Ronald

Student #: 11606661

E-mail: mutobvu@yahoo.com

Supervisor: Dr W. Munyoka

E-mail: Willard.munyoka@univen.ac.za

SURVEY QUESTIONNAIRE

SECTION A: DEMOGRAPHICS

1. What is your age in years?

<16	1
17-25	2
26-35	3
36-45	4
46-55	5
55 +	6

2. What is your gender?

Male	1
Female	2

3. What is your highest level of Education?

Primary school	1
Matric/high school	2
Diploma/Degree	3
B.Tech/ Honours Degree	4
Postgraduate	5

SECTION B: BUSINESS INFORMATION ABOUT THE SMMEs

4. What type of a business (SME) do you own?

Sole Trader	1
Partnership	2
Close corporation	3
Private company	4
Cooperative	5

5. How long has your SME been operating?

<1 year	1
1 year	2
2 years	3
3 years	4
4 years +	5

6. How many employees do you have?

One	1
Two	2
Three	3
Four	4

Five +	5
--------	---

7. How many other businesses do you own?

Tavern	1
Taxi/Buses	2
B & B	3
None	4
Other, specify below	5

8. Do you have a business bank account?

Yes	1
No	2

9. Which banking service do you use for your business?

Cell phone banking	1
Internet banking	2
ATM	3

Cheque book	4
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SECTION C: USE OF DIGITAL TECHNOLOGIES

10. Do you own any Digital Technology?

Yes	1
No	2

11. If your answer yes in Q10, what type of digital technology do you own (mark all that apply)?

Cell phone	1
Smartphone	2
Tablet	3
I Pad	4
Laptop	5
Other, specify below	6

12. Do you use any of the above-mentioned technology for business purposes?

Yes	1
No	2

13. If you answer yes in Q12, how do you use them? (Mark all that is applicable)

To place orders	1
To receive orders from customers	2
Customer relations	3
To communicate with suppliers	4
Other, specify below	5

14. If you answer NO in Q12, why don't you use it? (Mark all that is applicable)

Lack of knowledge of the device	1
Complicated to use the device for business	2

Cannot afford to buy one	3
Expensive to load airtime	4
Other, specify below	5

SECTION D: PRODUCTIVITY AND TECHNOLOGY USAGE IN THE BUSINESS

In this section, please indicate the extent to which you agree or disagree with each of the following statements. You may indicate your answer by placing a cross (x) in your selected response, using the scale:

(1) = Strongly Agree

(2) = Agree

(3) = Neutral

(4) = Disagree

(5) = Strongly Disagree

Productivity		Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
P1	My business is easier now that I use digital technologies.	1	2	3	4	5
P2	My family has more money because of the usage of digital technologies in my business.	1	2	3	4	5
P3	Digital technology saves me time.	1	2	3	4	5
P4	Digital technology lets me get more done during the day.	1	2	3	4	5
P5	Digital technologies help my business save money.	1	2	3	4	5

Revenue and Information and communication technologies (DIGITAL TECHNOLOGYS)		Strongly Agree (1)	Agree (2)	Neutral (3)	Disagree (4)	Strongly Disagree (5)
RI1	My customer's satisfaction improved since the use of digital technologies.	1	2	3	4	5
RI2	My revenue increased after using digital technologies.	1	2	3	4	5

RI3	My operations cost has been reduced after using digital technologies.	1	2	3	4	5
RI4	Using digital technologies has positively influenced my revenue.	1	2	3	4	5

Please indicate the extent to which you make use of the mobile devices you own in terms of the following options: always, often, moderate, seldom and never. You may indicate your answer by placing a cross (x) in your selected response, using the scale:

- (1) = Always
- (2) = Often
- (3) = Moderate
- (4) = Seldom
- (5) = Never

Connectivity		Always	Often	Moderate	Seldom	Never
		(1)	(2)	(3)	(4)	(5)
C1	I use digital technologies to stay in touch with my customers.	1	2	3	4	5
C2	I use digital technologies to stay in touch with my suppliers.	1	2	3	4	5
C3	Digital technologies give me access to new customers.	1	2	3	4	5
C4	I use digital technologies to stay in touch with my family.	1	2	3	4	5
C5	Digital technology helps me come and go without worrying about missing calls	1	2	3	4	5
C6	I digital technology to stay in touch with my friends.	1	2	3	4	5

Information		Always	Often	Moderate	Seldom	Never
		(1)	(2)	(3)	(4)	(5)
IF1	Digital technology helps me find work.	1	2	3	4	5
IF2	Digital technologies help me keep informed about prices in my business.	1	2	3	4	5

Usage		Always	Often	Moderate	Seldom	Never
		(1)	(2)	(3)	(4)	(5)
U1	Using digital technologies changed the way I do business.	1	2	3	4	5
U2	I am interested in learning about new features of digital technologies.	1	2	3	4	5
U3	I can't do business without digital technologies.	1	2	3	4	5
U4	I was among the first of my friends and business associates to use digital technologies.	1	2	3	4	5
U7	I use digital technologies for business more than for social calls.	1	2	3	4	5
U8	Digital technology gives me more control over who I talk to, and how/when I talk to them	1	2	3	4	5
U9	How often do you use digital technology in your business?	1	2	3	4	5

Please indicate the extent to which you make use of the mobile devices you own in terms of the following options: strongly satisfactory, satisfactory, neutral, dissatisfactory and strongly dissatisfactory. You may indicate your answer by placing a cross (x) in your selected response, using the scale:

- (1) = Strongly Satisfactory
- (2) = Satisfactory
- (3) = Neutral
- (4) = Dissatisfactory
- (5) = Strongly Dissatisfactory

Customer Satisfaction		Strongly satisfactory (1)	satisfactory (2)	Neutral (3)	Dissatisfactory (4)	Strongly Dissatisfactory (5)
CS1	How would you rate the level of your customer's satisfaction with your service?	1	2	3	4	5
CS2	How would you rate the level of complaints from your customers	1	2	3	4	5