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THE ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN THE OPERATIONS OF SELECTED SMES DURING THE COVID-19 ERA IN CAPE TOWN, WESTERN CAPE.

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DECLARATION

I, Juliet Nwakaego Nwachukwu, declare that this dissertation titled "The role of Information and Communication Technology in the operations of the selected SMEs during the COVID-19 era in Cape Town, Western Cape" for the Master of Commerce in Management at the School of Business and Finance, in the University of the Western Cape is my original work and has not been previously submitted to any other Institute of Higher learning. Furthermore, I confirm that all the sources consulted and quoted in the execution of this dissertation were indicated in the text and acknowledged through a comprehensive list of references.

Juliet Nwakaego Nwachukwu

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ABSTRACT

The COVID-19 pandemic resulted in the disruption of business operations as countries locked down economies to restrict the spread of the virus. This qualitative study investigates the role played by information and communication technology (ICT) in mitigating the impact of the pandemic on the operations of Small and Medium Enterprises (SMEs) located in Cape Town. Data was collected from 20 SMEs using semi-structured interviews. Results indicate that despite the lack of ICT resources and infrastructure readiness, skills deficit, and financial constraints, the interviewed SMEs integrated ICT into business operations to remain functional during the lockdowns. Furthermore, the ICT adopted aligned with the business operations such as marketing, accounting, payment platforms, inventory, and procurement management. Overall, the adoption and implementation of ICT applications enhanced SMEs' innovation, agility, visibility, and competitiveness levels during the COVID-19 pandemic. The dissertation recommends that SMEs should continuously upskill and update their ICT resources' capacity through training and strategic collaborations with stakeholders, including government agencies.

Key words: *Small Medium Enterprises, Information and Communication Technology, innovation, customer service, agility, business operations, and COVID-19.*

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION AND BACKGROUND OF THE STUDY

1.1. Introduction and Background

In developing countries such as South Africa, SMEs play a crucial role in economic development (Lawal, Worlu, & Ayoade, 2016; National Development Plan, 2013). The Organization for Economic Co-operation Development (OECD, 2017) emphasises that SMEs propel economies by creating jobs, goods, and services across sectors. However, SMEs are susceptible to unanticipated business shocks that alter firms' strategies, such as global pandemics (e.g., COVID-19), which negatively impact their growth and survival (Winston, 2020).

Within the South African SME context, businesses, pre-COVID, were already experiencing challenges with the contracting economy prior to the onset of COVID-19 in March 2020. The COVID-19 pandemic had a debilitating impact on SMEs and additional pressure on their business operations (Kalidas, Magwentshu, & Rajagopaul, 2020). The global-wide emergence of the COVID-19 pandemic in 2020 prompted innovation, resourcefulness, and dependence on technology in the midst of the global shutdown and lockdowns that confined people within their houses (OECD, 2020). As a result, the continued operations of business organisations during the pandemic, social and economic actors migrated to remote working and transactions through technological online platforms and systems (Basri, 2020).

The resilience and survival of organisations in the past decades have depended on Information and Communication Technology (ICT) to innovate operating systems. These are powered by artificial intelligence, automation, cloud technology, data analytics, and high-speed mobile internet (Sheikh, Shahzad, & Ku Ishak, 2017). Thus, ICT innovations have ensured business continuity, adoption and promotion of online transactions globally, thereby enhancing the ease of transactions and customer convenience (Akpan, Udoh, & Adebisi, 2020). ICT has been crucial, especially in business capacity development through improvement in communication business (Zhang, Diao, Chen, Robinson, & Fan, 2020).

Broadly, ICT has become a key driver for economic growth through innovations in organisational value chains. Warner & Wager (2019) highlighted the importance of ICT in

leveraging business operations in virtual selling and remote delivery compared to the traditional paper-based manual system, especially during periods of economic crisis and pandemics. The capacity of ICT to digitalise business activities to reduce physical contact has emerged as a tool and platform for ensuring ongoing economic activities during times of crises (Baig, Hall, Jenkins, Lamarre & McCarthy, 2020). In essence, ICT has improved the processing of information for data integration and enhanced agility and flexibility in business operations (Apulu & Latham, 2011). Similarly, the adoption and integration of ICT infrastructure enhance business performance through streamlining, optimizing, and automating processes to improve speed and reliability, thereby reducing delays in business transactions (Yunis, Tarhini, & Kassar, 2018).

1.2 Problem Statement

The study examines the significance of ICT in SMEs business operations during the Covid-19 pandemic. The COVID-19 pandemic exerted pressure on businesses in South Africa regardless of their size and location due to the disruption of the physical and business environment; still, the only remedy to business continuity is ICT. Scholars focused on the challenges associated with non-ICT adoption among SMEs in the pre-COVID (Al-Alawi & Al-Ali, 2015, Ramdansyah & Taufik, 2017, Mwila & Ngoyi, 2019; Tjipueja 2019; Modimogale & Kroeze, 2011, Giotopoulos, Kontolaimou, Korra, & Tsakanikas, 2017) as well as during the COVID-19 pandemic (Priyono, Darmawan, & Witjaksono, 2021; Khai, Onn, Zulkifli, Kandasamy, & Ahmad, 2020, Kumar & Ayedee, 2020, Cao 2021, Nawaiseh, 2021, Bvuma & Marmewick, 2020, Bularafa & Adamu, 2021, Kraus, Clauss, Breier, Gast, Zardini, & Tiberius, 2020, and Gregurec *et al*, 2021). However, there is a gap in our understanding the role of ICT in SMEs' business operations during the COVID-19 era.

The research problem statement formulated:

The study examines the significance of ICT in SMEs business operations during the Covid-19 pandemic. *COVID-19 has been the topic of the global limelight debate on its disruptive impact on the business environment, especially the SMEs.*

As a result of the movement restriction, SMEs' survival dependency centered on implementing ICT to link to the digitalised world. For instance, due to the impact of the pandemic, SMEs were

resilient to incorporating ICT for business continuity. Therefore, there is a need to establish ICT utilization and alignment in the SMEs' business operations during the pandemic.
Consequently, the research question reads:

How do SMEs utilise ICT in business operations of SMEs so as to adapt to remote operations?

To answer this question, 20 SMEs were contacted, and their response shed light on the role of ICT in SMEs' business operations during the COVID-19 era in terms of utilisation and alignment. It also aims to reflect the effect of SMEs' resilience in ICT adoption during the pandemic.

Although the role of ICT in the business operations of SMEs has been widely researched and debated in South Africa, especially during the COVID-19 era, that posed a significant challenge in the "new normal" environment. Acknowledging the pioneers of this study, such as (Modimogale & Kroeze, 2011, Mwila & Ngoyi, 2019, Bularafa & Adamu, 2021 and Cao, 2021), however, these scholars did not focus adequately on the ICT role in the operations of selected SME during the COVID-19 era.

Because the COVID-19 crisis is an unexpected event that still requires more studies, the gap has not been given significant debate in the academic world. Therefore, this study considers the nature of ICT, its utilization, and alignment as a problem to be examined in the body of knowledge. For instance, the SMEs' experiences utilizing ICT, challenges, and alignment in their business operations need attention. In order words, it is important to address the nature of ICT, its utilization, its alignment, and actual problems faced by SMEs. To address this gap in the body of knowledge, this study attempts to examine the nature of ICT, its utilization, and alignment among the selected SMEs' business operations; this led to the research problem development.

1.3. Aim of the Research

The study investigates the role of ICT in the operations of selected SMEs during the COVID-19 era. The research's main aim is to examine the extent of ICT adoption and utilization levels, its role in business operations, and alignment with the disruptive COVID-19 business environment.

1.4. The Study Objectives

These include:

RO1: To examine the level of utilization of ICT resources in the SMEs' business operations during the COVID-19 pandemic period.

RO2: To examine the role of ICT in the operations of SMEs during the COVID-19 pandemic period.

RO3: To evaluate factors influencing the adoption and alignment of ICT in SME operations to the new business environment.

1.5. The Research Question

RQ1: How did SMEs utilize the ICT resources during COVID-19 pandemic in Cape Town?

RQ2: What was the role of ICT in SMEs business operation during the COVID-19 pandemic?

RQ3: What factors influenced the adoption of ICT to align with changes in the COVID-19 business environment?

1.6. Research Contributions

The importance of carrying out the study that examines the role of ICT in SMEs' business operations during the COVID-19 era that disrupted all business environments is to ensure that the findings will benefit all the following stakeholders.

i. For SMEs, the findings of this study will impact the awareness creation that will accelerate digitalisation plans in their business operation. SMEs' experience during COVID-19 will guide the upcoming SMEs on ICT incorporation into their business from the start as part of a strategic plan.

ii. The study will significantly benefit the government in understanding the effects of ICT adoption on SMEs that are the lifeline of every nation's economy as they play a pivotal role in job creation. As a result, the government should ensure that appropriate measures are taken to embed ICT into SME business operations, which is a strategic plan. Competency and skills have been the reason for the non-adoption

of ICT; the government should ensure that training of the SMEs is incorporated into the Small Enterprise Development Agency (SEDA) plan.

iii. The significance of the study findings to the owners/managers will be an awaking call to ICT adoption as none of the business owners will want to have such experience as the COVID-19 pandemic that crumbled business operations. The study findings will enlighten them that ICT applications provides innovation, agility, and business performance for business continuity when facing any crisis, such as a pandemic in the future.

iv. The significance of the study to the general population, especially the young entrepreneurs that want to venture into entrepreneurship, is that digitalization incorporation into SMEs' business operations is a strategic way for business continuity.

v. The study provides great insight to the students and scholars on the role of ICT in the operations of SMEs during the COVID-19 era. The findings of this study will promote a knowledgeable impact on the students that the study established the reality on the SMEs challenges and how integration of ICT was useful.

vi. This study's significant findings will be valuable to policymakers when designing and implementing policies concerning ICT adoption among SMEs in collaboration with SEDA.

1.6.1. Theoretical Framework

The study's theoretical framework was adopted to understand the role of ICT in the operations of selected SMEs during the COVID-19 era and how it improves business operations by exploring the digital tools built and drawing from MacGregor & Vrazalic (2006) and Kergroach & Bianchini (2021) recommendations for SMEs' business operations.

The researcher draws from MacGregor & Vrazalic's book on SMEs as the engine of every economic growth to explain the causes of the non-adoption of ICT and its limitation during the COVID-19 era. However, the integration of ICT into the SMEs' business operations accelerated business continuity, and its significance in alignment with the ever-changing environment. The critical approach guiding this theory is technology readiness because SMEs' acceptance of the adoption of ICT results from perceived usefulness to function in the new normal environment. This is the reason the adopted theory is suitable for this study.

Formulating this theory of technology readiness gives an in-depth understanding of the ill-preparedness among SMEs and how digitalizing SMEs' business operations during COVID-19 was a game-changer that turned the new environment into agility, competitiveness, and innovation.

1.7. Research Methodology

This research was conducted in the Blackheath industrial area of Cape Town, in the Western Cape of South Africa. The study examines the role of ICT in the selected SMEs' business operations during the COVID-19 era, and the researcher adopted a qualitative methodology. The study followed an interpretivism paradigm and an exploratory case study design, which enabled the research to understand the role of ICT in SMEs' business operations during the pandemic.

The study population comprised the selected SMEs in Blackheath industrial estate, in Cape Town, Western Cape of South Africa, and a total sample of 20 SMEs participated in this study. The study sample consisted of males and females operating SMEs from two years and above. The purposive approach was adopted for sample selection, and data collection was done through semi-structured interviews to conduct face-to-face interviews. The use of a thematic analysis framework was used for data collection. The comprehensive, detailed methodology is discussed in chapter 3.

1.8. Organization of the Study

The study dissertation is arranged into five chapters, as shown below in the chapter Outlines:

Chapter 1: The chapter presents the introduction, background, problem statement, aims, and objectives.

Chapter 2: The chapter presents the Literature review and the gaps in the current literature.

Chapter 3: This chapter presents the research methodology and strategies adopted for the study

Chapter 4: This chapter presents the data analysis, discussion and interpretation of the key findings.

Chapter 5: This chapter presents the study's conclusions and recommendations.

1.9. Definition of terms

Small and Medium Enterprise

Small and Medium Enterprise with the acronym "SME" is a dynamic transformation force for economic growth (Lawal *et al.*, 2016). UNIDO (2005) defines SMEs in terms of the number of categories of employees based on different classifications according to whether the country is industrialized or developing (Berisha & Pula, 2015).

Information and Communication Technology

UNESCO (2000) refers to ICT as a combination of electronic informatics devices (hardware and software) assembled to transmit information electronically using telecommunication networks such as computers, telephones, faxes, and modems.

Innovation

Innovation is defined as the enactment of new ideas that reshape and re-size an organization which empowers it to adapt and influence the pace of change in the business environment (Druker, 1985).

Customer Service

Refers to the moment of truth that involves customer relationship management offering an excellent service that creates satisfaction for their clients (Brink & Berndt, 2008).

Agility

Agility is defined by Elali (2021) as an innovation strategy adopted by the organization to reinvent when faced with instability and disruptive circumstances.

Business Operations

Refers to the activities that businesses engage in daily that increase the enterprise's value for-profit purposes (Nguyen, Newby & Macauley, 2015).

COVID-19

COVID-19 refers to the new strain of novel coronavirus known as SARS-CoV2 that cause acute respiratory syndrome (WHO, 2020).

1.10. Summary

This chapter introduces the research by outlining the background of the study on the role of ICT in the selected SMEs' business operations during the COVID-19 era, which provided the objectives and research questions to explore. A preliminary literature review was written to identify the gaps that formulate the research problem. Furthermore, the theoretical framework and method were also presented, which will assist the researcher in elaborating on this study which the next chapter will discuss.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

The chapter reviews the literature on the role of Information and Communications Technology in the business operations of SMEs. The review of literature focuses on theoretical propositions and empirical research evidence on the factors, role, and adoption of ICT SMEs in general and specifically during the COVID-19 era. The following sections present the theoretical perspectives, definitions, and empirical evidence.

2.2. Definitions of SMEs

The definitions of SMEs vary across different countries (Muriithi, 2017). The Bolton Committee Report (1971) defined SMEs as independent businesses that are managed and controlled by the owners or part-owners, and command relatively small market share. Further, the Bolton Committee Report defined SMEs in terms of economic and statistical criteria. The European Commission defined SMEs as enterprises whose employment capacity and annual income do not exceed 250 employees and EUR 50 million.

The differences between small and medium enterprises are stated as follows: Micro Enterprises are categorized as firms with ten (10) employees, generating an annual turnover of EUR 2 million. While Small enterprises are classified as firms with fifty (50) employees with an annual turnover of EUR 10 million. Lastly, Medium enterprises are listed as a firm employing 250 employees, with annual turnovers of EUR 50 million. However, this definition centred on the distinction between different firm sizes and cannot apply across the EU countries (Abor & Quartey, 2010). The definitions of SME in the literature draw on different aspects that include numbers of employees, assets, and turnover.

An SME is an entity with less than 50 employees with a threshold of 250 employees (Meunier & Mickus, 2020). Ramsden (2020) defines SMEs in terms of the number of employees, sales, assets, and annual turnover. Bocconcelli, Cioppi, Fortezza, Francioni, Pagano, Savelli, & Splendiani (2018) define SMEs in terms of flexibility, creativity, innovation, and intentionality ability to adapt to an unstable environment regardless of limited resources and budget.

The United Nations Industrial Development Organization (UNIDO) (2005) defines SMEs in terms of the number of employees categorized in different classifications according to whether the country is industrialized or developing. SMEs are independent and self-funded entities that are registered or unregistered, accounting for two-thirds of new jobs created in the wider eco-system of firms (OECD, 2017).

This study adopts the UNIDO's classification and OECD's study on SME characteristics to examine the role of ICT in business operations during the COVID-19 pandemic period.

2.2.1. The Significance of SMEs

The economic growth of a country is positively linked with the expansion of SMEs, which reflects their capacity to create employment and primary indicators for economic development within the respective countries (Nwuzor, Chemezie, Okafor & Ifeanyi, 2019). SMEs that dominate the private sector account for ninety-nine percent (99%) as the key drivers of economic development and account for almost seventy percent (70%) of job creation and sixty percent (60%) in economic value-addition (OECD, 2016b & Fatoki & David, 2010).

Broadly, SMEs are critical for economic growth, employment creation, and revenue generation from different sectors, such as manufacturing, retailers, and tourism (Dhewanto, Nazmuzzaman, & Fauzan, 2020). Globally, SMEs stimulate and promote economic growth and influence policymakers and government institutions toward providing conducive business environments that support the expansion of the SME sector (Olawale & Garwe, 2010; Sippitt, 2014).

2.2.2. SMEs in South Africa

The South African National Small Business Amendment Act (2004), revised in 2019, defined SMEs as separate business entities based on four predetermined categories: standard industrial sector and subsector classification, cooperative enterprises, and non-governmental organizations. The emphasis that defined company size was in terms of the number of paid employees' total equivalent, turnover, and gross assets within each macro, small and medium enterprise sector or sub-sector of the economy (SANSBA 2004). On the basis of the Government Amendment Act, SMEs constitute 91percent of all registered businesses, employ

an estimated 60 percent of the labour force and contribute 34 percent of the Gross Domestic Product (GDP).

The South African Broad-Based Black Economic Empowerment (B-BBEE) legislation categorized owner-managed SMEs as follows: (i) Exempt Macro Small Enterprises (EME) organizations that have an annual turnover of ten (10) million Rands or less. (ii) Qualifying Small Enterprises (QSE) annual turnover ranges between ten (10) million Rands to fifty (50) million Rands annually, and (iii) Generic Enterprises (GE) organizations have an annual turnover of more than fifty (50) million Rands per annum (Goldberg, 2015).

2.2.3. SMEs and the South African Economy

Entrepreneurship is regarded as a vital mechanism that drives business and economic growth in South Africa (Doran, McCarthy, & O'Connor, 2016). Barot (2015) defined entrepreneurship as the discovery of business opportunities resulting from creative and innovative ideas to start a business or rejuvenate an existing one. However, the established firms developed by individuals independently through intrapreneurial activities are called SMEs (Darren & Conrad, 2009). In recognition of SMEs' contribution to the national economy in South Africa, the Government enacted the 1996 National Small Business Act that promulgated the establishment of the Ministry of Small Business in 2014 (Ayandibu & Houghton, 2017).

The study further explained that the Ministry of Small Business's mandate is to drive the growth and development of SMEs and contribute toward attaining the national development objectives. In addition, Small Enterprise Development Agency (SEDA) (2018) argued that the 2019 Presidential speech underscored the purpose of the Ministry of Small Businesses to transform and enhance the capacity of SMEs to drive economic development and job creation.

The focus on SMEs was underlined by the need to mitigate the impact of the economic recession experienced during the first quarter of 2018, largely due to poor electricity supply and financial difficulties that constrained business operations and productivity (SEDA, 2018). Mass, Nieman, & Nieuwenhuizen (2014) argued that unstable economic conditions forced the people of South Africa to engage in entrepreneurship for survival.

Prior to the March 2020 COVID-19 virus outbreak, South Africa had 2.6 million formal and informal SMEs comprising 1,748,031 (66.9 percent) informal enterprises and 755,265 formal

SMEs (SEDA, 2020/2021). The statistics showed that SMEs contributed towards creating 11,830,042 jobs in 2019 Quarter Four (Q4), compared with 10,406,070 in 2021Q, showing a gap of job loss of 1,423,973 during the peak of the pandemic. At the onset and during the COVID-19 crisis, the total number of SMEs declined from 2.6 million to 2.3 million. At the same time, 11 percent of SMEs closed down during the COVID-19 pandemic period (Stats SA, 2021). Furthermore, Winarsih, Indriastuti, & Fuad (2021) pointed out that the COVID-19 pandemic lockdowns and restricted movement reduced customers' physical access and frequency to shops as most organizations and SMEs were unable to offer online services due to a lack of ICT readiness and preparedness.

SEDA (2020), reported that the Western Cape Province has a higher proportion of formal SMEs compared to the rest of the South African Provinces. However, the total number of SMEs in the Western Cape declined from 298,819 in 2020 Q1 to 278,721 in 2021 Q1 (Stats SA, 2021), due to the movement restrictions for both local and international customers (Choi, Dutz, & Usman, 2020). The Western Cape Province is South Africa's regional entrepreneurial hub with a sophisticated, diverse and dynamic economy enhanced by renowned tourist destinations in the Cape Town Municipality. In addition, the Western Cape Province is the engine of the regional economy as most of the heavy and medium-sized SMEs that major in wine farming and production, and tourism attracted by beautiful beaches and the spectacular Table Mountains located in the Cape Town Metropolitan area (Ramukumba, 2014).

2.2.4. The Role of SME in the Economy

SMEs are essential actors in economic activities through job creation, revenue growth, and the socio-economic well-being of countries (Chimucheka, 2013). Abor & Quartey (2010) and OECD (2016a) highlight that SMEs are drivers of socio-economic development and contribute towards the accomplishment of sustainable development goals (SDGs), industrialization, and innovation that collectively boost the nation's gross domestic product (GDP). Ndiaye, Razak, Nagayev, & Ng (2018) point out that SMs shape the world's economy and account for 99 percent of the output firms in an economy (ILO, 2012; OCED, 2017). Perkin (2019) emphasized that SMEs create employment and contribute significantly toward value creation and Gross Domestic Product (GDP).

Moore, Palich, Petty, and Longenecker (2012) point out that SMEs in the United States of America, account for 52 percent of private employee levels and deliver 41 percent of the Gross

Domestic Product (GDP). In Europe and the United Kingdom, SMEs are estimated to account for 62 percent of total employment levels and 23 percent respectively (Muller, Gagliardi, Caliandro, Bohn, & Klitouet, 2014). In Germany, SMEs contribute 60 percent of the workforce (Day 2000) and 63 percent and 59 percent of total human resources in Italy and France (Burns, 2001) respectively. In Japan, SMEs contribute between seventy to ninety percent (70-99%) of job creation in the economy (Meti, 2013).

South African SMEs are viewed as a productive driver of economic growth and development that creates employment opportunities, generates higher production volumes, innovation, and entrepreneurial skills, and reduces poverty (Chimucheka & Mandipaka, 2015). SMEs contribute 60 percent towards employment levels and 50-60 percent of GDP (Department of Trade Industry, 2012). In the Western Cape Province, South Africa, SMEs accounted for 64.1 percent of the Province's Reginal Gross Domestic Product (RGDP) in 2018 (Young, 2019). Mafini & Omoruyi (2013) state that SMEs address unemployment, poverty, and inequality which are endemic in the South African economy and are the target for redress by the National Development Plan (NDP) in South Africa. Birch (1981) reported that low capital-labour intensiveness hinders the capacity of SMEs to create job opportunities and poverty alleviation in national economies.

The COVID-19 pandemic led to a reduction in operations and, in some cases, closures (Bartik, Bertrand, Cullen, Glaeser, Luca, & Stanton, 2020). In the United States, 43 percent of SMEs that contributed to the GDP and employment temporarily closed businesses, while 40 percent reduced employment, and the trend was equally the same for emerging and developing countries, including South Africa (Humphries, Neilson & Ulyssea, 2020; ITC, 2020; Mckinsey, 2020).

2.2.5. Challenges faced by the SMEs Ecosystem

The SME business ecosystem faces several challenges (Fubah & Moos, 2022) that arise from internal and external environmental factors (Gree & Thurnik, 2003). Olawale & Garwe (2010) pointed out that internal factors constraining the capacity of SMEs include challenges in accessing funds, attracting equity investors, limited management skills and experience, and limited investment in technology. The external environmental factors that negatively impact SMEs include government policies, crime and corruption and unmotivated labour. Brush, Ceru,

& Blackburn (2009) cited the SME size and age as some of the major obstacles SMEs face in their growth path trajectory through phases o
f incremental, rapid, and episodic growth.

Limited access to finance for business start-ups are some of the key challenges faced within the SMEs ecosystem (Bilal & Al Mqbali, 2015). Akinyemi & Adejumo (2017) stated that financial constraints include high-interest rates, collateral requirements, and poor financial records. In emerging and developing countries like South Africa, start-up capital is not incorporated into the financial support provided by banks and credit providers, which limits the eligibility of SMEs to access funds from finance providers during the development stages (SEDA, 2016).

Lack of access to finance contributes to the failure of SMEs in South Africa (Olawale & Garwe, 2010). Yoshino & Tahhizadeh Hesary (2016) pointed out that SMEs struggle with raising funds for business start-ups due to challenges in accessing credit facilities and credit worthiness. In addition to the inability to provide collateral, known as security, one of the key requirements for accessing loans from lenders/banks (Paul, Parthasarathy, & Gupta, 2017). Similarly, challenges in accessing physical infrastructures, such as premises, machinery, and the information infrastructure, are obstacles faced by SMEs as well as obtaining funding and tender opportunities (Yoshino & Tahizadeh Hesary, 2016).

Wiese (2014) highlighted the importance of the ability of SME management to align business operational activities to effectively deliver intended goals and objectives. Olafsen & Cook (2016) reported that SMEs, like any other business organization, require skilled employees and managerial skills, particularly, monetary management skills. Motsetse (2014) argued that besides access to finance, poor management skills and inadequately skilled labour are some of the significant challenges faced by SMEs. Hill (1987) reported that most SME managers and operators lack managerial expertise, appropriate training and experience in crafting and implementing strategic business plans.

Brink, Cart & Lighelm (2003) pointed out that SME owners/managers may have workable business ideas and competent in what they do even though they often lack managerial skills to operate businesses sustainably. Cover (1933) noted the negative consequences of poor management which accounted for business failures among SMEs in developed and developing countries. Empirical research studies cited the impact of management failure in the SME's

ecosystem, especially in the areas of financial management, accounting knowledge, credit and inventory management, cash flow, human resources and marketing management (Berryman, 1983; 1993; Bowen, Morara & Mureithi, 2009).

The OECD (2013b) study identified the inability to partner with appropriate and knowledgeable stakeholders in business networking at the local, national, and global levels as some of the critical managerial skills lacking in SMEs. The internal weaknesses are compounded by external challenges such as corruption, lack of government support, negative perceptions, poor time, and quality management (Agwu & Emeti, 2014; Emuze, 2011; Chu, Kara & Benzing, 2010) that constrain the development and growth of SMEs.

2.3. ICT Definitions and Perspectives

2.3.1. ICT Definitions

ICT is defined as digital technologies designed to collect, organize, store, process data and relay information within internal and external organizations (Ritchie & Brindley, 2005). The main ICT tools include telephone, point-of-sale systems, standalone PCs, networked environments, internet, and credit card facilities. According to Sung, Kim & Chang (2015) ICT enables the convergence of audio-visual systems and telephonic networks through computer devices using one link systems that enable the user to access, store, transmit and manipulate information. Thus, ICT enhances operational efficiency thereby enhancing business competitiveness (Jung, Schneider & Valacich 2010).

UNESCO (2000) pointed out that Information and Communication Technology is a combination of electronic informatics devices, that is, hardware and software assembled to transmit information electronically using telecommunication networks such as computers, telephones, faxes and modems. Thus, ICT infrastructure enables electronic translation, storage, retrieval, and management of data and information for communication purposes, problem-solving, and value addition.

2.3.2. ICT Perspective

ICT has been viewed differently depending on the context it has been adopted. Technological ideologies and ecosystem variations have primarily informed the contexts used to define ICT to embrace perspectives on socio-economic development, education, and business (Zuppo, 2012). The technological context emphasizes defining ICT in terms of digitalised technologies such as the Internet, Big-data, artificial intelligence (AI), robotics, and related innovative technologies that redefine and revolutionize business and society (Roman-Urrestarazu, Robertson, Yang, McCallum, Gray, McKee, & Middleton, 2018).

While the business context definition of ICT refers to the technological devices used by organizations to process information for communication and transactions through different software and hardware such as telephones, desktop computers, scanners, printers, and internet modems (Wilkinson & Michelle, 2018; Zhang, Diao, Chen, Robinson, & Fan, 2020). This study viewpoint is built on the business context as ICT accelerates business growth strategies in service delivery, business performance, agility, and competitiveness (Gilaninia, Mousavian, Omidvari, Bakhshalipour, Bakhshalipour, Eftekhari, & Seighalani, 2012).

2.3.3. ICT Infrastructure

ICT comprises two (2) distinct infrastructures, namely, hardware and software systems. The different infrastructures are designed or developed to collect, process, transmit, and store data to execute and automate specific business functions (Kurniawati, 2020). Kurniawati (2020) states that, the 21st century heralded an upgrade to Web 2.0 and data storage systems (cloud), mobile data, visualizations, big data and analytics, the Internet of things, and more recently, artificial intelligence, referred to as Industry 4.0.

Lucchetti & Sterlacchini (2004) categorize ICT applications in business operations into three distinct groups, that is, general-user, production-integration, and market-oriented groups. The *general-user group* is described as a group that utilise technologies such as telephone, e-mail, and Internet to carry out administrative functions. While the *production-integration group* tightly couples ICT with the functionality of the business in the production of goods. Lastly, the *market-oriented group* focuses on the use of ICT for marketing or communicating with the outside world to enhance business competitiveness (Taiminen & Karjaluoto, 2015).

The most common objectives behind ICT applications are to improve the organizational existence and operational excellence through cost reduction and technical enhancement (Nguyen, Newby, & Macaulay, 2015). ICT contributes towards redefining business models, decision making, and innovation for competitiveness towards implementing business and market strategies to meet customer expectations (Modimogale & Kroeze, 2011). Thus, ICT infrastructure integrates and transforms business operations to improve efficiencies that influence and change market demand (Mutula & Van Brakel, 2007).

2.4. The Role of ICT

Minton (2003), argues that ICT is an enabler for global market accessibility through reduced transactional costs and bridges the constraints of distance, thereby improving the coordination of the activities within the organizational boundaries. Implementing ICT in organizations reduces costs while promoting productivity and cost-effectiveness which motivate business owners to adopt digitalization for communication (Lymer, 1997 & World Economic Forum, 2020).

ICT enhances organizational productivity and service delivery, communication, collaboration, customer access, managerial decision-making, and data management (Sajuyigbe & Alabi, 2012). As pointed out by Ashrafi & Murtaza (2008), that Information and Communication Technology (ICT) impacts organisational performance and profitability, market share, value creation and bridging the link between the demand and supply of goods and services.

Information and Communication Technology (ICT) increases the speed of information and ensures the reliability of transactions between business-to-business (B2B) and business-to-customers (B2C) (OECD, 2004). Lauder & Westall (1997) argue that ICT enhances accessibility to cheaper and faster communication channels that promote better customer and supplier relations, effective and efficient marketing, development of products and services and access to remote training. Ardjouman (2014) reported that ICT improves efficiency, increases resource allocation and technical performance, and reduces transactional costs.

2.4.1. Barriers to ICT Integration

Barriers to adopting ICT in business operations and the subsequent negative impact on business and economic development apply to both big organisations and Small and Medium Enterprises (OECD, 2019). There is need to invest in internet-connected hardware and software that empower ICT-related knowledge and skills development which integrate information and communication technology for social and business activities (Yalin, Karadeniz & Sahin, 2007). The barriers to the integration of ICT include policies that curtail the integration of national and organizational ICT policies (Luboobi, 2007; Usman & Said, 2014). Organizational-level policies tend to focus on limited administrative actions, while the regulatory framework for telecommunication and ICT property rights tends to hinder ICT integration (Loing, 2010).

Paudel, Pandit, Mishra & Segarra (2011) cited the high cost of ICT infrastructure as one of the barriers that hinder ICT integration and acquisition of hardware such as computers, laptops, scanners, digital cameras and relevant software. Usman & Said (2014) point out that cost is one of the three factors hindering ICT integration in addition to culture and policy. Paudel *et al*. (2020) argue that the perception of cost is a major factor in ICT adoption which changed due to the COVID-19 pandemic outbreak and enhanced the transition of business transactions from offline to online platforms and modes of communication.

2.5. Theoretical framework

This study is guided by the technology readiness model designed to illustrate computer acceptance behaviours, which is discuss below.

2.5.1. The Technology Readiness Model

The Technology Readiness Model (TRM) refers to the propensity to embrace new technologies by people in order to accomplish tasks either from home or at the workplace (Parasuraman, 2000). Parasuraman developed this model in the year 2000. The theoretical framework encompasses four dimensions: optimism (views that ICT offers people efficiency, flexibility, and increased control in daily activities); innovativeness (locates individuals at the forefront of adoption of ICT), discomfort (perception that individuals lack control of the technology which

result in feeling of being overwhelmed) and insecurity (distrust and concerns towards technology). In this study, the TRM model is adopted in combination with the Technology Acceptance Model (TAM), which is perceived in terms ease of use. Integration of the two is known as Technology Readiness-Acceptance Model (TRAM).

Technology readiness speaks of two behavioural types: specifically, positive and negative technology readiness. The positive technology centred view assumes optimism and innovativeness of the technology readiness model that influenced the adoption of technology based on perceived usefulness. While the negative technology readiness assumes perceptions of discomfort and insecurity associated with technological challenges.

This study focuses on the positive behaviour – optimism and innovativeness proposition and its centrality in the adoption of technology during the COVID-19 pandemic. The integration of ICT within SME operations was a determining factor that was perceived as useful for business continuity during the pandemic crisis (Zhu & Luo, 202; Park & Zhang, 2022), notwithstanding the discomfort and insecurity (challenges). Thus, the study examines the technology readiness among SMEs towards ICT adoption without preparedness. ICT improves the business activities of SMEs in terms of connectedness, agility, business performance, customer delivery service accessibility, and flexibility, regardless of the challenges faced (Richardson, Gorley, Wang, Aiello, Pintsuk, Gaganidze & Rieth, 2021).

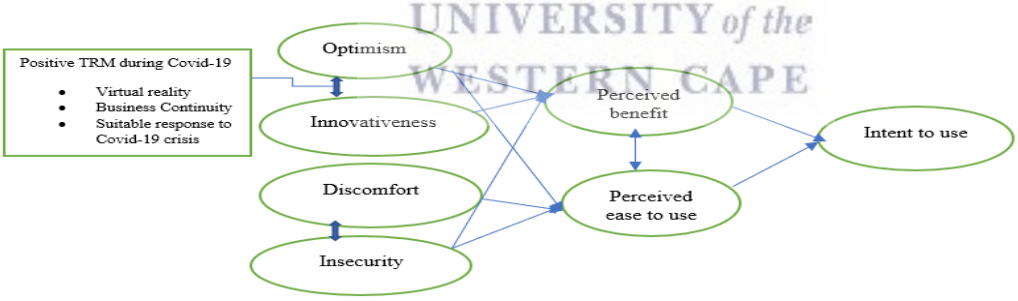

Figure 2.1: The Technology Readiness & Acceptance Models

Source: Parasuraman (2000:307-320)

2.6. Utilization of ICT in Business Organizations

The adoption and utilization of ICT transformed the efficiency, effectiveness, and swift response in SMEs business operations which enhanced business growth and survival (Galva-Gorriz & Castel, 2010). Tarute & Gatautis (2014) argue that the development of ICT changes

the operational structure and methods of communication. While Warner and Wager (2019) state that the adoption of ICT eradicates the traditional approaches, thereby leading to the transformation of businesses and the achievement of sustainable competitive advantage. Relatedly, ICT utilization influences business flexibility in responding to changing business environments and enhancing global visibility, timely information, and facilitating different transactions, thereby overcoming traditional barriers to the conduct of business (Manochehri Al-Esmail, & Ashrafi, 2012).

Consoli (2012) highlighted the effect of ICT in organizations in terms of four dimensions that enhance customer satisfaction, namely, performance, growth, expansion, new products and services. The dimensions are assumed to considerably impact innovation, productivity, organization expansion, and product quality. Wilkinson & Michelle (2018) argue that the changing evolution of ICT has impacted all spheres of life extending to the political, economic, social, and education sectors. The usage of ICT accelerates during periods of disruptive pandemics and enable businesses to devise innovative methods through incorporating digitalization for business continuity (Kraus *et al.,* 2020).

The rapid increase of ICT fundamentally changed business operations and transactions during pandemics and economic crises (Akpan *et al.,* 2020). The OECD (2020) pointed out that pandemics generate significant uncertainty, which lead to the increase in the adoption and utilization of digital tools by business organisations. ICT helps them to build resilient, sustainable, and innovative business solutions and flexibility in work arrangements, such as remote working and agility through transferring operations to online platforms.

2.6.1. SME Operations and ICT Utilization

The advancement in digitalization promotes the significance of ICT as a transformation mechanism for businesses to maintain competitiveness (Ramayah, Ling, Taghizadeh & Rahman, 2016). ICT transforms the business environment through value-addition, and innovations that improve business operations (Aljabre, 2012). The growth in the adoption and utilization of ICT infrastructure has been enhanced by developments that include Web 2.0 and Cloud computing, Big and mobile data, visualizations, the Internet of Things (IoT), and artificial intelligence. These components are vital for improving business performance and

strengthening the competitive advantage of SMEs (Napitupulu, Syafraullah, Rahim Abdullah, & Setiawan, 2018).

Mutula & Van Brakel (2007) highlighted that ICT enhances the survival of SMEs within the competitive global environment. Mwila & Ngoyi (2019) pointed out that the ICT-driven value-addition in the business operations of SMEs in Zambia. Furthermore, highlighting that ICT enhances business operations through cost reduction, simplified business modalities and increased productivity and competitiveness. The recommendations include the need for governments to promote the adoption of ICT by SMEs through tax deductions and the implementation of government ICT frameworks and Public-Private Partnerships (PPP) that enhance access to ICT equipment by SMEs.

Tjipueja (2019) argue that ICT opportunism is mediated by dynamic capabilities that enhance the survival of SMEs in ever-changing business environments. In addition to citing SMEs in Namibia that leveraged technological opportunism to improve performance through learning and embracing integrative and transformative capacities. The recommendations were that SME owners should improve capacity through collaboration in the development of skills and managerial abilities.

According to (Mwila & Ngoyi, 2019), lack of knowledge, cost implications, and unskilled staff prevented SMEs from implementing ICT in Gauteng Province, South Africa. They recommended that SMEs should invest in staff education, recruiting ICT expertise, building technology culture, and knowledge in harnessing ICT tools that enhance business competitiveness, despite the challenges of intermittent load shedding in the electricity supply by Eskom. Al-Alawi & Al-Ali, (2015) reported that in Kuwait, the adoption of e-commerce depended on organizational, technological, and environmental factors. Further stating that SMEs need to understand the benefits of e-commerce in daily business transactions and activities.

2.6.2. Factors that Determine SME Business Operations Digitalization

Giotopoulos *et al*. (2017) identified firm motives for enactment, ICT resources, internet integration, e-sales, and e-procurement as the main factors that determined digitalization and the adoption of ICT by SMEs in Greece. Further noting that the effective adoption of ICT-

related applications depends on human capital, expert knowledge, visionary leadership and growth-driven mindsets. Ramdansyah & Taufik (2017) cited the significance of compatibility, top management support, macro drive and tangible benefits accruing from e-commerce and organizational performance in the adoption of ICT by SMEs.

ICT enhances competitive advantage and value-addition (Jung, Schneider & Valacich, 2010). In turn, Snihur & Wiklund (2019) pointed out the challenges faced by SMEs in adapting to the new business model of digitalization. They cite the following key challenges claims by owners/managers that ICTs are not user-friendly, lack of computer literacy by the employer and employees, unwillingness, cost implications, and lack of knowledge and skills despite the perceived benefits (Bwalya, 2015). Acs, Astebro, Audretsch, & Robinson (2016) identified lack of knowledge and limited budgets for investing in ICT as some of the main barriers to the non-adoption of ICT among SMEs. Further to citing limited individual capacity and past unpleasant experiences in ICT adoption and the negative perceptions on the benefits of full ICT adoption.

Bouazza, Ardjouman & Abada (2015) point out that SMEs will not adopt ICT if the benefits do not outweigh the cost in addition to consideration of the constraining internal and external factors (Ramayah *et al.*, 2016). The internal factors include knowledge of ICTs and organizational size, while the external factors include the industry structure, technology service providers and regulations (Baker, 2012). Giotopoulos *et al.* (2017) highlight the existence of proper business plans and implementation strategy as some of the key factors contributing to the adoption and utilisation of ICT in business organizations. While risk aversion is associated with the privacy and security of ICT systems and concerns on the risk of data being misused when connected to devices and machines (Abazi, 2016). MacGregor & Vrazalic (2006) point out that the ever-changing environment requires constant changing and updating technologies in the transition of business operations from manual systems and that delays in ICT adoption hinder innovation and competitiveness.

2.7. The Origin of COVID -19

The virus originated in Wuhan city in China and rapidly spread to Japan, South Korea, Germany, the United States of America, and thereafter, spread rapidly around the world (Torales, O'Higgins, Castaldelli-Maia, & Ventriglio 2020). The spread of the COVID-19 pandemic was classified and denoted by WHO as the 2019 novel coronavirus (2019-nCoV)

(Spagnuolo, De Vito, Rengo, & Tatullo, 2020). At the onset, it was designated as Group 2B of a beta-Coronavirus (B-CoV) and categorized as the Orthocoronavirinae sub-family of medical epidemics. The effect of the virus resulted in high mortality rates between March 11, 2020, and April 10, 2020, which affected an estimated 1560 000 persons across the globe during that short space of time which precipitated the imposition of lockdowns and restrictions on the movement of people worldwide (https:// ourworldindata.org/coronavirus-source-data). The COVID-19 pandemic shocked the world, and it was classified as a deadly global coronavirus disease that caused acute respiratory syndrome coronavirus -2 (SARS-CoV-2). The COVID-19 morbidity resulted in high mortality rates that substantially disrupted the economic activities globally (World Health Organization, 2020).

The Corona Virus outbreak was pronounced by the World Health Organization on March 11, 2020, as a global pandemic World Health Organization, 2020). The severity of person-to-person infection rates prompted governments to restrict movements from outside and within their national borders. The restricted movements aimed at containing the spread of the disease, which in turn, abruptly restricted economic and social activities when social distancing was introduced to mitigate the spread of the contiguous disease.

The resultant global lockdowns imposed by governments restricted the movement of people and goods and disrupted economic and business operations globally (Baldwin & Tomiura, 2020). Banga, Keane, Mendez-Parra, Pettinotti, & Sommer (2020) point out that domestic restrictions on social gatherings and movement confined people indoors, which halted social and economic interactions. Thus, the global disruptions to social and economic caused by the COVID-19 pandemic disrupted social and economic activities across the world.

South Africa followed other countries and locked down the country in March 2020, thereby imposing restrictions on people's movement and business operations in line with the World Health Organization (WHO) recommendations.

In response to the restrictive COVID-19 lockdowns, some business organizations adopted ICT as a transformation tool to mitigate the loss of customers and supply chains (Choi *et al.*, 2020). This study examines the adoption of ICT in Small and Medium Enterprise operations during the COVID-19 era in the Western Cape, South Africa.

The timelines indicating COVID lockdown in South Africa is shown in Table 2.1 below.

Table 2.1: Alert levels of lockdown implementation in South Africa

Alert levels of Lockdown and the implementation dates in South Africa			
Alert Level	**Date**	**Adjusted Date**	**Determination of alert adjustment**
Level 5	March 26, 2020	April 30, 2020	High Covid-19 spread and low health system readiness
Level 4	May 1, 2020	May 31, 2022	Moderate to high Covid-19 spread and low to moderate health system readiness
Level 3	June 1, 2020	August 17, 2020	Moderate Covid-19 spread and moderate health system readiness
Level 2	August 18, 2020	September 21, 2020	Moderate Covid-19 spread with a high health system readiness
Level 1	September 21, 2020	December 28, 2020	Low Covid-19 spread with a high health system readiness

Source: https://www.gov.za/COVID-19/about/about-alert system

2.7.1. The impact of COVID-19 Pandemic Outbreak

The COVID-19 pandemic outbreak caused the global lockdown in economic activities and physical isolation. Business organizations responded to the COVID-19 pandemic induced lockdowns by migrating to online platforms and digitalised operations in conducting business activities (Kumar & Ayedee, 2021). Digitalizing business operations created new business opportunities and strategies for seamless internal and external transactions, customer service delivery, contacts, product delivery, and packaging services (Müller & Hopf, 2017). The new virtual platforms promoted the provision of digitally enabled services to ensure business continuity in the face of social distancing during the COVID-19 pandemic period (Choi *et al.*, 2020 & Christopoulos, 2021).

The COVID-19 pandemic restrictions forced business organisations and SMEs to adopt digital tools to navigate challenges to business continuity and sustainability through adopting new technologies to achieve their business goals. (Richardson *et al.*, 2021). The benefits of digitalization include developing new ICT capabilities through 5G networks, artificial intelligence, smartphones, and 3D printing (Richter, 2020 & Li, 2020). Hasan, Rehman & Zhang (2021) pointed out that ICT-powered digital transformation accelerated remote working to enhance and sustain organizational performance, innovations, and competitiveness during the COVID-19 pandemic period. In South Africa, despite these ICT-driven interventions, some SMEs faced unsustainable viability challenges and closed down (Walsh, 2020). The general business operations comprise business management functions such as marketing, accounting, human resource, inventory management, production, and customer service. The study

investigated the role of Information and Communication Technology in the operations of selected Small and Medium Enterprises (SMEs) during the COVID-19 period in Cape Town, Western Cape Province, South Africa.

2.7.2. COVID-19 and its Disruptive Effect on SMEs

The Organisation for Economic Co-operation and Development (2020) points out that the COVID-19 pandemic is one of the most significant public health and economic crises that altered the competitive landscape for business organisations, especially the SMEs (Wenzel, Stanske & Lieberman, 2020). Amankwah-Amooah (2020) pointed out that the COVID-19 pandemic is one of the most unforeseen global health pandemics that disrupted the world economy through extended periods of lockdowns, death rates, social distancing, and related preventive measures imposed by governments. The disruptive effects led to the restructuring traditional operating systems and processes and enhanced the transition to digitalization to mitigate the impact on business operations (Cuschieri, 2020 & ITC, 2020).

Notwithstanding the contributions of SMEs to economic growth, most of the SMEs lack the capacity to align business modalities to new realities, as evidenced during the COVID-19-induced crises (Amankwah-Amoah, Khan, & Wood, 2021). Despite the mitigating measures adopted by governments worldwide, the lockdowns and remote working resulted in job redundancies and business closures, and the SME sector was not spared (Bachtiger, Adamson, Quint & Peters, 2020). Thus, the COVID-19 pandemic severely eroded the capacity of SMEs to continue operating, and globally most closed down, resulting in job losses in the face of severe cash crunches, declining sales, business unsustainability, and the extended loss of business opportunities (Kumar, Doshi, Khan & Rathire, 2021; Saluja, 2012).

Nawaiseh (2021) reported that SME owners/managers in Jordan encountered operational and financial difficulties due to remote working regulations, supply chain constraints, and failure to meet the ICT-driven new customer service delivery modalities. Bularafa and Adamu (2021) reported that in Nigeria, the COVID-19 pandemic degraded the capacity of the SME sector, precipitated by supply chain constraints and the inability to migrate to digital platforms for business continuity. Bvuma and Marmewick (2020) reported that in South Africa, the adoption of ICT among SMEs was complicated by external factors such as lack of knowledge and unaffordability. Further noting the need for Government intervention and support for the SME

sector to upskill and adopt ICT infrastructure and resources. Oktora, Lolita, Ismail, Novesar, and Bon (2020) reported that the pandemic shipwrecked SME operations in Indonesia and Malaysia and pushed some of them to migrate to digital platforms to ensure business survival.

2.8. ICT Adoption during COVID-19 Pandemic Period among SMEs

ICT was adopted as a quick tool by organisations in responding to the unprecedented, highly transmissible COVID-19 virus, which affected human interactions resulting in the imposition of global physical distancing and quarantine regulations to control the infection rates (Vargo, Zhu, Benwell & Yan, 2021). The COVID-19 pandemic curtailed human interactions as lockdowns were imposed, which affected shopping, working, learning, and face-to-face interactions. The paradigm shift caused dramatic changes in economic and social environments.

The disruptive nature of the COVID-19 pandemic motivated the adoption of ICT by organizations as they re-strategized and transformed their business operations and ways of doing business (Li, 2018 & Rajagopaul et al., 2020). Winarsih *et al.* (2020) pointed out that the disruptive impact of the pandemic on businesses was severe as regulations-imposed shop closures and stay-at-home regulations, which saw the emergence of ICT as the critical enabler for business connectivity and continuity.

Richter (2020) state that digitalization facilitated quick connectivity and responsiveness to the new business environment, thereby ensuring business continuity during the COVID-19 pandemic period. Kumaravel, Subramani, Jayaraj, Sivakumar, Madurai, Manavalangar, Annam, and Subramaniam (2020) reported that ICT applications and software adopted by business organizations included 5Gs, Artificial intelligence, Smartphones, mobile technology, the Internet of Things, Cloud Computing, 3D scanning/printing, social media platforms, big data, and data analytics. Yang, Fichman, Zhu, Sanifilippo, Li, and Fleishmann (2020) pointed out that ICT played a pivotal role during the COVID-19 pandemic period by enabling the creation of integrated systems that enhanced agility, innovation, and competitiveness within the business ecosystem.

2.8.1. ICT and SMEs Business Performance

The COVID-19 pandemic impacted human health (Sahoo & Ashwani, 2020), which forced governments to implement lockdowns, social distancing regulations, and stay-at-home restrictions which closed down global travel and economic activities and business operations (Gregurec *et al.*, 2021). Faced with the global lockdowns, organizations responded to the new "normal" environment through harnessing technology that enabled remote working for employees to continue carrying out business functions (Joshbersin, 2020). Organizations responded to the restrictions by adopting ICT to navigate the uncertainty of global lockdowns and remote working at the onset and during the COVID-19 pandemic (Brynjolfesson, Horton, Ozunek, Rock, Sharma & TuYe, 2020). Brancombe (2020) highlights the constraints imposed on business operations by the Covid-19 pandemic, which gave birth to digitalised-based applications for communication and conducting business operations and transactions.

2.8.2. ICT and Innovation in SMEs Business Operations

Druker (1985) define innovation as a process of adopting new ideas that reshape and re-size organizations which empowers them to adapt and influence the pace of change in the business environment. Am, Furstenthal, Jorge, and Roth (2020) pointed out that embracing innovation ensured business sustainability during the COVID-19 crisis. Thus, the COVID-19 pandemic fostered the acceleration of digital transformation in business operations and re-engineering mechanisms to drive revolutionary paradigm shifts in most areas of business operations and performance improvement (Papagiannidis, Harris & Morton, 2020). Furthermore, the disruptive impacts of the COVID-19 pandemic pushed organizations to adopt innovative approaches that leveraged cutting-edge technologies to enhance sustainable business operations and development. Organisations migrated business operations to online platforms to ensure continuity anchored on innovative ICT applications and processes in the new COVID-19 induced "normal" business environment (OECD, 2021).

The rapid digitalization transition bridged the gap and enabled organizations to adapt and survive business environment uncertainty while enhancing their ability to exploit the emerging opportunities during the COVID-19 pandemic era (OECD, 2020). Digital tools and applications became the catalysts for innovation in areas such as supply chains, operations, and customer delivery and services during the COVID-19 pandemic. The main digital tools and applications

include Cloud computing, Internet of Things, and Artificial Intelligence (Shah, 2020). Hamburg (2021) points out that the adoption of ICT contributed towards business transformation and value creation in the new COVID-19 business environment. Walsh (2020) argues that the implementation of ICT during the pandemic increased customer satisfaction, business efficiency, and new innovative services that enhanced competitiveness.

2.8.3. ICT and Competitiveness on SMEs Business Operations

The adoption of ICT improves operational efficiency, which enhances the achievement of business competitiveness (Jung, Schneider & Valacich, 2010). Porter & Millar (1985) pointed out that ICT adoption positively impacts organizational competitiveness through creating a competitive edge and adaption of business systems and structures for competency, performance, and customer retention. Thus, the COVID-19 pandemic crisis pushed business organizations to revisit business models to ensure survival and business growth (Isenberg & Di Fiore, 2020). Inasmuch as the global crisis disrupted business operations, it opened up new opportunities through the digitalization of business operations that enhanced survival and competitiveness (Li, 2020).

International business organizations deployed ICT for business connectivity in the key areas such as customer delivery, supply chain, and business operations, which accelerated business competitiveness during the COVID-19 pandemic crisis (Thomas, Morris & Edgecliffe-Johnson, 2020). Rachmawati, Choirunnisa, Pambogyo, Syarafina, & Ghiffari (2020) highlighted the direct contribution of ICT towards remote working by workers and organizations and promoted e-commerce for transactions through the use of online platforms for marketing, e-sale, and e-payments. ICT enhanced and empowered the re-invention of business operations and competitiveness during the turbulent COVID-19 pandemic crisis (OECD, 2021).

2.8.4. ICT and Customer Service Delivery on SMEs Operations

ICT enabled customer delivery service and service-related activities and processes delivered electronically through internet-based platforms, telephonically and automatically (Djajanto, Nimran, Kumadji & Kertahadi. 2014). ICT motivated the development of different self-service technologies, measures of service quality, and relationship marketing focused on ensuring

customer satisfaction and loyalty. Writz & Lovelock (2021) pointed out that customer service involves direct engagement activities to meet the needs of clients and customers. Brink & Berndt (2008) stated that customer delivery service, also referred to as customer relationship management (CRM), focuses on providing excellent customer service and creating customer engagement and satisfaction using technology software. Cook (2008) highlighted that effective customer delivery service enhances the competitive advantage of organizations.

ICT applications accelerate reliable and provide fast channels that enhanced customer service delivery the during the COVID-19 pandemic period (Ceylan Ozkan & Mulazimogullari, 2020). Carvalho, Bonzo, & Zenaide (2020) pointed out that the COVID-19 pandemic created opportunities for business organizations to utilise ICT applications in meeting new customer expectations, responding to market structures and supply chains for the 'new normal society'. Thus, ICT enabled the restructuring of business models during the Covid-19 pandemic period to satisfy customer demands and expectations in line with the development of the new shopping and delivery context.

ICT-based adaptability is an imperative business competency that enhances alignment with new customer behaviour patterns using digital marketing, sales, and service delivery using Artificial Intelligence and related ICT applications platforms (Sandberg, Holmström & Lyytinen, 2020). The COVID-19 crisis enhanced the role of Information and Communication Technology (ICT) to address customer engagement and service delivery during the COVID-19 pandemic period (Butt, 2020). Further stating that the status of ICT-readiness by businesses before the COVID-19 pandemic period was a key determinant in the ability and capability of business organizations to adopt and utilise ICT at the onset and during the COVID-19 pandemic period.

2.8.5. ICT and Agility on SMEs Business Operations

Agility refers to the ability to respond speedily to trends in uncertain and turbulent environments (Agile Alliance, 2021b) and the capacity to navigate the unknown in order to exploit business opportunities (Tilman & Jacoby, 2019). While, Holbeche (2018) define agility as the ability to speedily innovate, adapt and manage environmental changes in a manner that approximates the realities of organizations to that of living organisms. Elali (2021) highlighted that agility is a newly developed innovation strategy adopted by organizations to reinvent themselves when

faced with instability and disruptive circumstances. Further stating that agility differentiates flourishing business organizations from failures measured in terms of the ability to combine leadership, flexibility, proactiveness to sustain competitiveness. Arokodare & Asikhia (2020) point out that agility is the best option to adopt in response to unexpected changes, especially when faced with disruptive business environments.

Kniffin, Narayanan, Anseel, Antonakis, Ashfirdm & Bakker (2021) pointed out that ICT redefines, reconfigures, and disaggregates, automates, and accelerates business operations towards improving productivity and creation of value chains. Serrat (2021) state that from an organizational perspective, ICT becomes an essential tool for responding to the disruptive impact of the COVID-19 pandemic on the global economy, society, and workforce. Further stating that ICT accelerated the transformation and agility of businesses during the disruptive COVID-19 business environments.

The COVID-19 pandemic signalled the importance of reinventing operational and business modalities and reengineering systems to facilitate proactive organizational changes (Kosack, Stone, Sanders, Avramopoulos, Bsiron, Brodsky & Usascheva, 2021). Further noting the source of dynamism that power agility, such as acceleration of creativity and innovation, and ICT integration in business operations.

Baldwin (2019) highlight that compared to the periods before the outbreak and during the COVID-19 pandemic and concludes that the crises propelled organizations to implement digitalization within short spaces of time to ensure survival and continuity. Organisational agility during the COVID pandemic was characterized by investments and effective utilisation of ICT infrastructure and resources to adapt to the disruptive changes in the environment (Elali, 2021). Further, ICT facilitated remote working through the internet and related communication platforms to ease transactions during the COVID-19 pandemic crisis (Wilen, 2020).

2.9. ICT and SME Operations during the COVID Era

ICT played a significant role in mitigating and overcoming the challenges faced by SMEs arising from the COVID-19 pandemic crisis, which led to employee layoffs, monetary crisis, employee health issues, declining customer demand, and eroded revenue streams (Kumar *et al.*,2021). The adoption of ICT and related Fourth Industrial revolution (4.0) technology, social

media, and e-commerce improved business operations and customer service (Kumar *et al.*, 2021). Further recommending the need for the adoption of ICT by SMEs to alleviate the disruptive impact on business operations from future crises such as the COVID-19 pandemic.

Gregurec *et al.* (2021) reported that the adoption of ICT by SMEs in Croatia during the COVID-19 pandemic enhanced organisational agility, customer-centricity, and reinvention of business strategies to enhance competitiveness, productivity, and performance. The study further noted that disruptive business environments arising from pandemics such as COVID-19 require SMEs to acquire new competencies, knowledge, and experiences that capacitate them to build robust business ecosystems (Gregurec *et al.*, 2021). Priyono *et al.* (2020) highlighted that the adoption of digital technologies reconfigured the business models of SMEs in Indonesia. Further noting that SMEs with high ICT maturity levels responded to the challenges quicker and transited to digitization speedily compared with SMEs with low levels of ICT maturity.

According to Bouazza *et al.* (2015), SMEs with limited ICT literacy survived the crises through forging partnerships with external organizations with digital capabilities. Further noting that the partnerships enabled SMEs to align business operations with the new environmental realities and to successfully compete in the new market. Cao (2021) highlighted that mobile payment services adoption among SMEs in China as an alternative to cash payment for shopping during the COVID-19 pandemic period helped them to leverage technologies and ICT competencies to meet the new customer service demands.

Technology related factors such as lack of technological competencies and network connectivity were cited as the main challenges that prevented SMEs from adopting online payment systems (Cao, 2021). Kho, Gillespie & Martin-Kha (2020) reported that the Malaysia Government facilitated the migration of SMEs to digitalization during the COVID-19 pandemic, which improved product development and service delivery during the COVID-19 pandemic period.

2.10. Limitations and Gaps in the Empirical Evidence

Previous studies prior to the COVID era (e.g., Al-Alawi, & Al-Ali, 2015; Ramdansyah & Taufik, 2017; Mwila & Ngoyi, 2019; Tjipueja, 2019; Modimogale & Kroeze, 2011) have established that the role of ICT in the operations of the SME sector.

In turn, there is a growing body of empirical evidence on the role of ICT and digitalization during the COVID-19 era (e.g., Priyono *et al.*, 2020; Oktora *et al.*, 2020; Kumar *et al.*, 2020; Cao, 2021; Nawaiseh, 2021; Bvuma & Marmewick, 2020; Bularafa & Adamu, 2021; Giotopoulos *et al*., 2017; Kho *et al.*, 2020, and Gregurec *et al.*, 2021).

Ismail, Jeffery, and Belle (2011) highlighted the lack of investment in ICT and resistance to adopting ICT as a competitive tool for value-addition among SMEs. MacGregor & Vrazalic (2006) emphasized that ever-changing environments require constant upgrading of ICT technologies. Taiminen & Karjaluoto (2015) categorized the focus of ICT applications in business operations, namely, general-user, production-integration, and market orientation. Mackinsey (2020) estimated that 40 percent of South African SMEs adopted ICTs in their business operations prior to the COVID-19 pandemic.

The body of knowledge from the previous studies indicates that there has been not much empirical research evidence on the role of ICT in SMEs during COVID-19, especially on ICT utilization and alignment to the changing environment. Therefore, this study contributes to the gap in research evidence and examines the role of ICT in the business operations of selected SMEs in the Western Cape Province, South Africa, during the COVID-19 pandemic period.

2.11. Conceptual Framework

The conceptual framework emerged from previous literature contributions on the role of ICT in SMEs' business operations before and during the COVID-19 era. The premise of the conceptual framework draws from the experiences of SMEs during the COVID-19 pandemic, which constitutes the study background, challenges arising from the non-adoption of ICT, and the immediate adoption of ICT during the COVID-19 for business continuity. The framework seeks to explore the experience of the selected SMEs in the Blackheath industrial estate, Cape Town, in the Western Cape.

Further, the formulation of the conceptual framework guided the theoretical framework for the research question, methodology, and data collection and analysis.

Figure 2 below illustrates that ICT mitigated the business environment disruption faced by SMEs during the pandemic. The key ICT strategies drew upon internet connectivity devices - ICT hardware and software that bridged the Covid-19 pandemic barriers faced by SMEs. The study proposition is that the adoption of ICT in the business operations of SMEs enhanced agility, innovations, and competitiveness in delivering services to their customers and fostered business performance during the COVID-19 era. The above can be understood in the discussion on SMEs and ICT in terms of the constructs depicted in Figure 2.2. below:

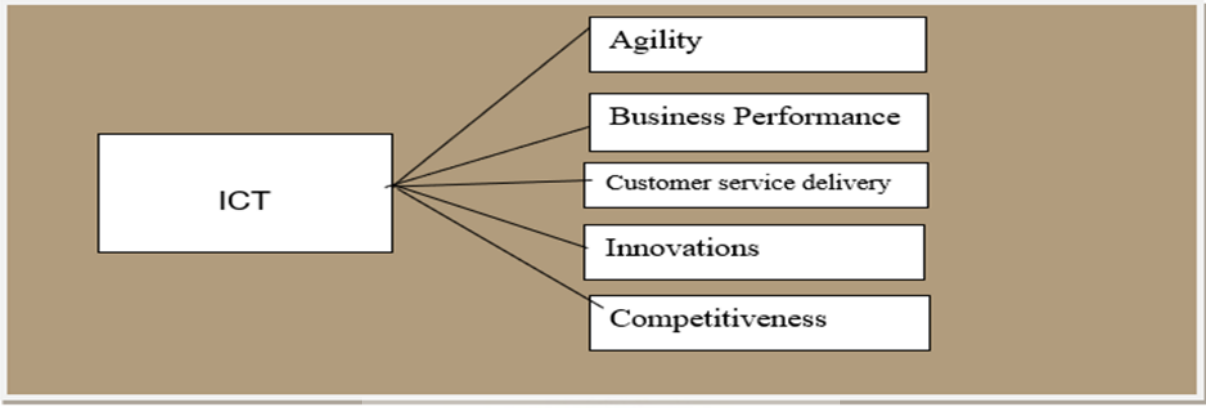

Figure 2.2: Conceptual Framework

Source: Researcher's Construct

1. SMEs are catalysts for economic growth and unemployment reduction (e.g., OCED, 2020; Olawale & Garwe, 2010; Hashim, 2015, and Myslimi & Kacani., 2016).

2. ICTs infrastructure and resources include computers and software that handle information and transactions in different organizations (Wilkinson & Michelle, 2018) and devices and infrastructure that facilitate the converging of information through the digitalised method within an external organization (Zuppo, 2012).

3. Application of ICTs in business organizations for purposes as either-or combinations of the following: general-use, production-integration, and market-orientation (Taiminen & Karjaluoto, 2015).

4. The significance of aligning ICTs with the ever-changing environment (MacGregor & Vrazalic, 2006) and specifically in this study is to the COVID-19 business context.

The study unit of observation is ICT and its application in the business operations of SMEs during disruptive crises arising from the COVID-19 pandemic crises which caused global lockdowns from March 2020. ICT enhances the capability and capacity of SMEs to align to uncertain and disruptive business environments arising from unforeseen pandemics (MacGregor & Vrazalic, 2006). Furthermore, the integrative framework of ICT provides a holistic theoretical basis for SMEs to explore the "new normal" environment (Ramdani, Chevers, & Williams, 2013).

2.12. Summary

The chapter presented previously studied works of literature, which commences from understanding the role of ICT in the SMEs' operations prior to the COVID-19 pandemic and within the COVID-19 era. The chapter proceeds with the definitions of SME and ICT, the role of SMEs in the economy, and the significance of ICT on the business operations of SMEs, then the contextualization of SMEs in South Africa. This chapter further discussed the role of ICT in SME operations during the COVID-19 era that disrupted the business environment. The conclusions are based on the ICT-driven strategies adopted by SMEs to enable business continuity during the Covid-19 pandemic period. Furthermore, the gaps regarding the SME and ICT adoption were established. The next chapter 3 cantered on the methodology adopted to answer the research objectives.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter presents the study methodology adopted to answer the research questions, which begins with the selected research paradigm and its justification. The following sections discuss the research approach, design, data collection methods, sampling methods, data analysis, and procedure instrument. The chapter concludes with the ethical considerations implemented in this research.

3.2. Research Paradigm

A paradigm is a fundamental belief system that gives the researcher the worldview understanding of study in a reality form (Guba & Lincoln, 1994 & Gage, 2000). Kelly (2013) reiterates that the idea of the research paradigms is based on the foundational belief system that guides the researcher for inquiry. In the research paradigm, there are four different approaches, namely: Positivism, interpretivism, constructivism, and critical theory (Patton, 2005; Sobh & Perry, 2006).

Table 3.1: Four Approaches to Research Paradigm

Positivism	Interpretivism	Constructivism	Critical theory
Based on truth and reality	Believes that realities are constructed using multiple views	Contains a philosophical stand	Entities exist independently
The logical analysis explained actual events assertively	Understand and interpret how individuals interact in social phenomena	Constructs reality in a study	Freedom enhancement
The viewpoint focuses on the unchanging laws that rule human behaviour	Requires events to be understood through the eyes of the participants	Focus emphasizes on the existence of multiple views	Explain and analyse societal conflict
Its investigation is not measured based on individuals and social phenomena	Analysing approach generates inductive data using a semi-structure interview	Understand the historical, cultural, and settings of the participants	Use realist ontology to effect change

Source: Patton (2005); Sobh & Perry (2006: 11/12)

3.2.1. Interpretivism Paradigm Justification

For this study, interpretivism research is adopted; the reason is to be informed by the assertions of the paradigm that realities are created through the eyes of the participants instead of the researcher (Cohen, Manion, & Morrison, 2002). This implies that the understanding of the role of ICT in selected SMEs operations during the COVID-19 era is obtained through accounts and explanations of the SMEs (participants) using the semi-structured interview to get comprehensive insights and draw conclusions of the ICT utilization and alignment during the disruptive business environment. This paradigm enables the researcher to have multiple views centered on the participants' life experiences, such as COVID-19.

3.3. Research Approach

Creswell & Creswell (2017) refer to a research approach as a plan and procedures that measure how data collection is interpreted from assumptions to detailed methodology. Hence it involves techniques used in studying a topic. There are three types of research approaches, namely, qualitative, quantitative, and mixed methods.

The quantitative research approach refers to an approach that bases its strategy on collecting information for statistical quantification and analyses (Saunders, Lewis & Thomhill, 2009). In contrast, the Qualitative research approach focuses on an in-depth understanding of subjective interpretations of the narratives and insights of respondents to build a grounded theory. The qualitative approach enables the researcher to interrogate and interpret the ideas and inner meanings that present detailed explanations of the phenomenon (Quinlan, Zikmud, Babin, Carr, & Griffin, 2015). While the mixed method involves integrating two forms of data (the philosophical assumption and theoretical framework) in collecting data. This combination of qualitative and quantitative data gives an in-depth understanding of the problem compared to the standalone approach (Creswell & Creswell, 2017 & Creswell, 2014).

3.3.1. Qualitative Approach Justification

This study adopted a qualitative approach to gain an in-depth understanding of the study problem (Quinlan *et al*., 2015 & Hartley, 1994). One of the reasons for using a qualitative

approach is to obtain a thorough knowledge of the SME business operations that were shipwrecked due to the COVID-19 pandemic outbreak that created a disruptive and new normal business environment. The qualitative approach gave a holistic and insightful knowledge of how SMEs were challenged during the pandemic. As a result, all businesses, particularly SMEs, rely on ICT adoption to bridge the gap between SMEs and the digital world.

3.3.2. Research Design

A research design is a blueprint for fulfilling research objectives and comprises the following characteristics, namely: is a time-based, procedural plan that focuses on the research question, guides the selection of sources of information and provides the framework for specifying the relationships among the study's variables (Schindler, 2019). Lewis (2015) describes research design as the total plan by which the respondent in a proposed study is selected for data collection and generation. There are five qualitative approaches as shown Table 3.2 below:

Table 3.2: Five qualitative approaches

Basis considerations	Narrative Research	Phenomenology	Grounded Theory	Ethnography	Case Study
Focus of research approach	Explore individual life	Drive the understanding of experience	Develop a hypothesis that is grounded in data collection from the field	Describe and interpret culture-sharing group	Develop in-depth illustration and analysis of a case or multiple cases
Unit Analysis	Examining of one or more individuals	Investigate of several individuals with same experience	Using process, actions and interaction to study event that involves many individuals	Study people that share same culture	Focus on studying event or activities that is more than one individual
Types of research problem best suited	Tell individual experience stories	Describe the lived phenomenon	Theories are gathered based on participants view	Give interpretation to the shared culture group patterns	Present an in-depth understanding of a case or cases
Nature of disciplinary origins	Drawing focus is on humanities such as literature, history, anthropology, psychology and sociology	It is centered on philosophy, psychology, and education	Information is drawn from sociology	From anthropology and sociology	Drawing focus on psychology, law, political science and medicine

Source: Creswell (2011:269-284)

3.3.3. Case Study Design

The study adopted a case study strategy which provided in-depth insight and a rich understanding of the research context into the phenomena of research interest and the enacted processes (Yin, 2009 & Eisenhardt & Graebner. 2007). The case study design is important because the evidence source relies on multiple data (Yin, 2018). Rittenhofer (2015) considered individuals' experiences to study the event in order to provide an in-depth understanding of the cases. The case study uses an inductive and descriptive approach to thoroughly examine the issues under investigation.

3.3.4 Justification of the Case Study Research

The research adopted an exploratory case study design since the goal was to describe and develop an analytic framework using units of analysis in the study (Rowley, 2002). The case study explores, understands, and explains better using "how or why" a phenomenon in a particular context (Yin, 2018). They adopted a case study design to study the role of ICT in the operations of selected SMEs during the COVID-19 era through extensive and in-depth descriptions to enhance the overall understanding of the phenomenon. Furthermore, the qualitative nature of the case study offered the researcher a broader picture of the disruptive impact of the COVID-19 pandemic on the business operations of SMEs.

3.4. Research Setting

The study was conducted within the Blackheath Industrial Park, which is located in Cape Town, Western Cape, South Africa. The Blackheath Industrial Park was selected as a site for the study because of its centrality and accessibility through pivotal road links such as N1 and N2 from R300.

All the Small and Medium Enterprises (SMEs) in the study were located within the Blackheath Industrial Park, located in Cape Town, South Africa. The sub-industries included Manufacturing, Construction, Wholesale, Retail, Transport, Health, Accommodation, and Business Services. The study defined an SME as an entity employing less than 50 employees with a threshold of 250 (Meunier & Mickus, 2020; Grix, 2018). While the categorization of SMEs adopted the Broad-Based Black Economic Empowerment (B-BBEE) legislation

framework promulgated by the South African government. The three distinct categories as per the Broad-Based Black Economic Empowerment (B-BBEE) legislation are as follows: (i) Exempt Macro Small Enterprises (EME) organizations that have an annual turnover of ten (10) million Rands or less. (ii) Qualifying Enterprises (QE) have an annual turnover ranging between ten (10) million Rands to fifty (50) million Rands annually, and (iii) Generic Enterprises (GE) organizations have an annual turnover of more than fifty (50) million Rands per annum (Goldberg, 2015).

The study focused on SMEs within the first two categories, that is, (i) Exempt Macro Small Enterprises (EME) and Qualifying Enterprises (QE), which employed a minimum of fifty (50) and a maximum of two-hundred and fifty (250) employees. Notwithstanding the variations in the definition of Information, and communication technologies (ICTs), the study defined ICTs as technological devices used by organizations to process Information for communication and transactions using software and hardware such as telephones, desktop computers, scanners, printers, and internet modems (Wilkinson & Michelle, 2018; Zhang, Djao, Chen, Robinson & Fan, 2020).

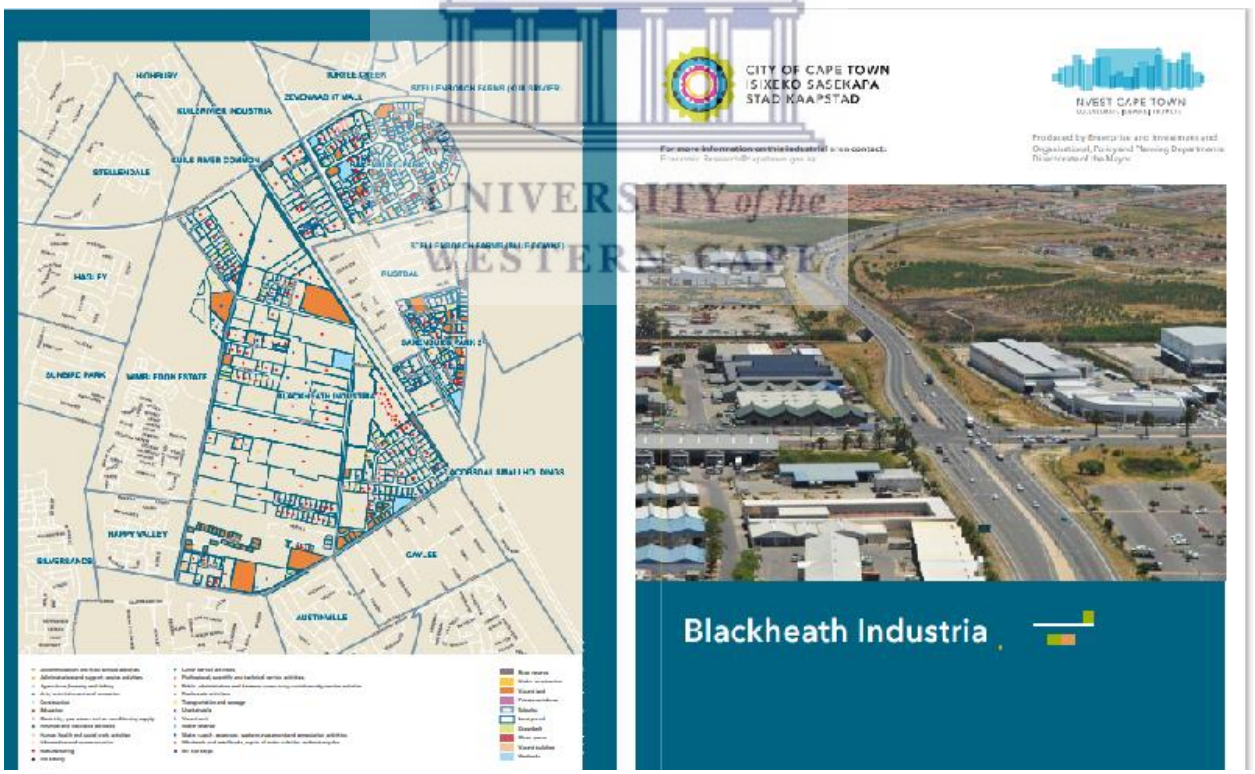

Figure: 3.1: Map of Blackheath Industrial area, in Cape Town

Source: Economic.Research@capetown.gov.za

3.5. Sampling

The purpose of this qualitative research is to provide a comprehensive understanding of the role of ICT in the business operations of selected SMEs during the COVID-19 era, in Cape Town, Western Cape Province. An important consideration was taken in selecting the best sampling strategy that effectively developed an in-depth understanding of the complex issues on the challenge of not adopting ICT previously. Also, to understand the current nature of ICT adopted and its roles in the business operations of SMEs. Then, the level of utilization of the ICT and its alignment to the SMEs business operations during the COVID-19 era.

A population is the total number of people participating in a research study (Saunders *et al.*, 2012). The study population comprised 20 SMEs located in Cape Town.

3.5.1. Population and Sample Size

A population is the total number of people participating in a research study (Saunders *et al.*, 2012), and a sample is the subset of the population (Tustin, Lighthelm, Martins & Van-Wyk., 2010). SMEs in Blackheath Industrial Area, in Cape Town, Western Cape Province, were the constituted population of this study. In a qualitative study, a standard sample size would be that sample that adequately answers the research question.

To reduce reoccurring errors, the researcher reviewed previously studied methods adopted to determine study sample sizes. Yin's (2009) study recommends that young academia begins with relatively small and straightforward case study participants to avoid the stress of managing and analysing high-volume data (Holloway, 1997). Curran & Blackburn (2001) suggested that cases should not be more than ten (10) in small business research, while Crabtree & Miller (1992) support that it should be between six (6) and eight (8) for homogenous samples. In contrast, Yin (2009) stated that evidence of multiple cases is compelling when considering the robust study that validates understanding (Levy & Powell, 2005) hence the lack of consensus on an ideal number of research cases.

For this reason, this study selected twenty (20) SMEs who were contacted and confirmed suitable to participate on the research project. The request for participation was sent through e-mails, telephonically, and face-to-face to the owners/managers of different firms. In addition,

an overview of the purpose of the study, why participation is essential, and the requirement for involvement if accepted to participate were indicated.

3.5.2. Sample Techniques

Sampling involves drawing a sample from the population, consisting of two broad categories: probability and non-probability (Wild & Diggins, 2013). Purposive sampling is a non-probability sampling technique that selects a study sample based on the study's characteristics and objectives (Palinkas, Horwitz, Green, Wisdom, Duan, & Hoagwood, 2015). It is a selective or subjective sampling method that is useful when a targeted sample needs to be reached quickly (Crossman, 2018).

The study used a maximum purposive sample to draw the study sample from the database provided by an organization called The Business Associate, an affiliate of the Small Enterprise Development Agent (SEDA) based in Cape Town. The selection criteria were based on the location, years in operation, and type of business in order to broaden the diversity of SMEs to enable an in-depth understanding of the research phenomena (Creswell & Poth, 2016). The sample was selected from the population (Lawrence, 2014; Keyton, 2006) guided by the abovementioned factors. The Business Associate organization provided the researcher with contacts and referrals of SME owners/managers through the snowball sampling technique (Chibelushi & Costello, 2009).

A sample of 20 SMEs located within the Blackheath Industrial Park, City of Cape Town, agreed and consented to participate in the study. The SMEs were drawn from the following sub-sectors: manufacturing, business service, retail, accommodation, construction, transportation, and health (See table 2 below). The study selected SMEs with a minimum of 2 years in operation who are over 20 years of age as the study avoided the involvement of minors in order to adhere to the ethical consideration rule. The summary and characteristics of the sample are shown in Table 2 below.

Table 3.3. Profile of Samples for the Study

Pseudonym	Operation Years	Business Type	Formal or Informal	Gender
01E	5	Guest House	Formal	Male
02E	5.6	Fast-food outlet	Formal	Male
03E	6	Transportation	Formal	Female
04E	3.4	Corporate training	Formal	Male
05E	4.6	Manufacturing	Formal	Male
06E	4	Medical Provider (Health)	Formal	Male
07E	4.7	Gym	Informal	Female
08E	4.9	Event Planner	Formal	Male
09E	5	Tailoring shop	Formal	Male
10E	5	Transportation	Formal	Male
11E	2	Butchery store	Informal	Female
12E	5	Restaurant	Formal	Male
13Q	7.9	Health Sector (Eye Doctor)	Formal	Male
14Q	8	Construction	Formal	Male
15Q	7	Consultant	Formal	Male
16Q	7	Laundry service	Formal	Male
17Q	5	Manufacturing	Formal	Male
18Q	6.5	Grocery	Formal	Male
19Q	9	IT service	Formal	Male
20Q	12	Ice Cream Producer	Formal	Male

Source: Researchers Own Construct

3.6. Data Collection Method

The study collected primary and secondary data. Primary data refers to information collected at the source by the researcher in contrast to secondary data is previous data collected by others for their own purposes (Hox & Boeije, 2005).

3.6.1. Primary Data

The study collected primary and secondary data. Primary data refers to information collected at the source by the researcher. The study used semi-structured interview protocols to conduct face-to-face, telephonic, and videoconference interviews (See Appendix 1 Interview Schedules). A pilot test was conducted prior to the main study, to confirm the suitability of the

research questions, semantics and the time required to conduct the interviews. The pilot feedback enabled the researcher to adjust the research questions, semantic, and the interview duration before the final interviews commenced.

However, following the actual I interview, the participants comprised fourteen (14) SME owners, five (5) partners, and one (1) Senior Associate staff member. The researcher and participants complied with the COVID-19 pandemic regulations, which were in place during the period the study was conducted. The key regulations guiding face-to-face interviews stipulated mandatory social distancing, wearing of face masks, and adherence to sanitation protocols.

In contrast, secondary data is previous data collected by others for their own purposes (Hox & Boeije, 2005).

In line with the COVID-19 regulations stated above, face-to-face interviews were conducted with sixteen (16) respondents within their respective work locations. While face-to-face interviews with three (3) participants were conducted in a Coffee shop, and one interview was conducted via the Zoom online platform. Informed consent and permission to record the interviews were requested before interviews were conducted. All the participants were asked questions in the same sequence and the researcher probed for elaboration as and when necessary. The researcher conducted all the interviews and took detailed notes during the course of each interview. Each interview lasted for approximately forty-five (45) minutes which was adequate for purposeful conversations (Burgess, 2002) and adequately covered the key research questions (Bryman, 2016). All the interviews were conducted in English language, and all participants were conversant with this mode of communication which also avoided the need for translating the recorded interviews. All interviews were recorded for accuracy and consistency.

3.6.2. Secondary data

Secondary data sources used in the research included reports and publications on SMEs, availed organizational reports, and relevant online databases (Hertler & Tasso, 2015). Most sources were accessed via the University of the Western Cape library databases.

3.7. Data Analysis

Content analysis was used to decipher and extract the key issues that emerged during face-to-face and telephonic interviews (Wooffitt, 2005). The data analysis involved cleaning out and coding and analysis of the narratives presented by the participants (Creswell, 2009). The initial stages involved transcribing the interview notes to identify patterns in the communication content provided by the participants (Creswell, 2009). Content analysis of the data comparisons across all the interview sets was done to gain common threads in deciphering the respondents' views. The audio recordings were transcribed and analysed following the same procedure as the hand-written notes.

The researcher adopted the following logical data analysis order after Creswell (2009).

The codes developed by identifying similar words and meanings from the interviews on the respective questions.-Thereafter, primary headings were established as critical focal points for organising the case narratives.

The researcher used the electronic spreadsheet on Microsoft excel to group data in different categories. After that, themes were emerging from the qualitative data were identified as shown on Table 3.4 below

Step 1: The data from the field notes and audio recordings for analysis were organized and prepared by the researcher, which involved transcribing interviews, scanning relevant materials and arranging data according to the sources.

Step 2: The researcher read the data collected carefully to obtain a clear sense of the data collected from the participants and to obtain the overall credibility of impressions.

Step 3: The researcher adopted a detailed coding method and categorized themes to draw out similar meanings expressed around each question. Thematic analysis was used to make the coding and categorizing process systematic and convenient. The coding involved putting words/materials into components and clustering similar topics with categorized labelling, which enabled the researcher to conduct preliminary analysis and recoding data where applicable.

Step 4: The researcher used the coding method to generate descriptions of the settings or people with categories or themes for analysis.

Step 5: The researcher developed some detailed discussions with participants with respect to the themes to obtain in-depth descriptive information to uncover the main findings.

Step 6: The researcher finally interpreted the meaning of the data by comparing the findings based on the information collected from literature and relevant theories.

Table 3.4: Main Research Themes

Research Question	Main Theme
What ICT resources and infrastructure were available in SMEs?	ICT resources/tools before COVID pandemic - Desktop computer - Scanner - No-Smart Phones /Inland Phones
Did SMEs adopt & utilise ICT in business operations of SMEs during COVID?	ICT Resources & Infrastructure acquired/utilised during the COVID-19 pandemic - Internet connected device: Smart Phones, Laptops, 3D printers etc - Cloud computing, Main Business operations where ICT was applied on: - Customer delivery service - Marketing (for online platform) - Production - Accounting
How were the ICT infrastructure and resources aligned with operations & justification changes in the COVID -19 business environment?	Utilization of ICT resources & Infrastructure during the COVID-19 pandemic - Laptops were used for remote working - Smartphones were used for communications, ordering and payment - Internet connectivity empowered the devices
What were the challenges/constraints faced in the adoption of ICT by SMEs?	Challenges of ICT adoption: - Funding - Skills - Readiness

Source: Researchers Own Construct

3.8. Trustworthiness of the Study

Trustworthiness in qualitative research is the confidence that the data and its interpretation method meet the required quality of the study (Polit & Beck, 2009). The equality in quantitative studies is validity and reliability. However, the four trustworthiness components that ensure valid data interpretation are credible, dependable, confirmable, and transferable (Oates, 2006). The researcher ensured that the components mentioned above were compliant.

3.8.1. Credibility

Credibility refers to the believability that identifies the truth in the place of research findings (Anney, 2014). Moser & Korstjen (2018) argued that credibility deal with the conviction of how the qualitative researcher is in the fact of the study's findings. Credibility aims to ascertain the truth and accuracy of the research findings. Using triangulation, the researcher establishes the study's credibility, which gives a comprehensive understanding of a phenomenon from multiple approaches (Patton, 1999). For instance, to confirm the emerging findings, the investigator categorized each stakeholder (SMEs) for the study under evaluation to verify the result.

3.8.2. Transferability

Transferability is that aspect of trustworthiness that explains the level of degree the study demonstrates its findings to assist the reader in applying their investigation to another similar situation (Nobel & Smith., 2015). The primary purpose of transferability is to transfer evidence to the end user's setting (context) for systemic reviews and sound decision-making (Munthe-Kaas, Nokleby, Lewin & Glenton, 2020). The researcher used the thick description method to ensure transferability, enabling the judgment of the research context to fit other contexts. Purposive sampling assisted the researcher in focusing on the participants with sound knowledge of the issue under investigation to avoid bias and subjectivity.

3.8.3. Dependability

Dependability refers to the solidity of the data collected and or findings over time (Anney, 2014). The purpose is to systematically explain the research evidence as claimed (Guba & Lincoln, 2005). The researcher investigated SMEs who experienced the effect of the Covid-19 pandemic period on their business operations and had not yet migrated to the digital world at the onset of the Covid-19 pandemic period. The study adopted the interview guide used throughout the research to ensure uniformity and validity of the collected data, making the results reliable.

3.8.4. Conformability

Conformability is the criteria to assess whether the objectives investigated and results conform or collaborate with other researchers (Baxter & Eyles, 1997). The aim is to establish that the interpreted data is derived from the study. To ensure the conformability of the study, the

researcher investigated the identified objectives to validate the output for accountability of research decisions and activities based on how data was collected, recorded, and analysed. The researcher employed audit and reflexivity techniques to establish conformity.

According to Shenton (2014), the reflexivity technique is helpful in qualitative research because it creates awareness for the researcher to be cautious of the background, which constantly eliminates bias during the data-gathering process. Furthermore, the audit technique is useful in ensuring the conformity of the findings when writing results which assists the researcher in detailing the data collection procedures, design, and interpretation (Shenton, 2014).

3.9. Ethical Considerations

To ensure that the participants in this research were protected in terms of the right to participation, the researcher obtained ethical clearance from the UWC Ethics Clearance Committee granted in October 2021 under HSSREC Reference Number HS21/8/12 (see Appendix 1.). The researcher obtained informed consent from participants before interviews were conducted and informed participants upfront that the research was for academic purposes only.

All the participants were notified that their participation was voluntary and that they could withdraw from the interview at any stage. The researcher requested permission to record the interviews before the commencement of the interviews. All the participants were assured that strict confidentiality and anonymity would be adhered to during the research process and write-up as per the attached (Appendix 2). In addition, the researcher advised that the UWC will safely secure the data for a duration of five (5) years.

3.10. Summary

The methodology presented a detailed description of how data was organized, collected, and analysed, which provided the study road map. This chapter is an integral aspect of the study; failure to give an appropriate research design will lead to invalid findings and results. A detailed explanation was given of how the data were collected and the selection of the participants. The validity, reliability, and ethical issues have been discussed.

CHAPTER FOUR
RESULTS AND DATA ANALYSIS

4.1. Introduction

This chapter presents the analysis and findings on the role of ICT in the operations of selected SMEs in Cape Town, South Africa, during the COVID-19 pandemic era. The key sections are the research setting, biographical data, research findings, discussion, and interpretation of the study findings. The subsequent section presents an overview of the research setting and key characteristics of the respondents and SMEs in the study.

4.2. Profile of Respondents

The study sample comprised twenty (20) respondents consisting of twelve (12) participants from Exempted Macro Enterprises and eight (8) drawn from Qualifying Enterprises within the Manufacturing, Construction, Wholesale & Retail, Transport, Health, Accommodation, and Business Services located within the Blackheath Industrial Estate in Cape Town, South Africa. Each SME was assigned a code to identify it and for ease of reference for each of the twenty (20) respondents. The first two digits represented the respondents' designated number from one (01) to twenty (01-20), followed by types of SMEs (E – Exempted Macro Enterprise and QE – Qualifying Enterprise). Followed by the letter that denotes the number of years the SME has been operating as a business (Y), then the business sector such as retail (R), Business service (BS), manufacturing (M), Transport (T), Accommodation (A), Health (H), and Construction (C).

The core business activities of each of the SME subsectors are as follows:

- Retail services businesses specialized in groceries, pet foods, eateries and butchery.
- Business Services offered Consultancy services and IT support services
- Transport sector businesses offered E-haling (Uber) and courier services
- Accommodation sector businesses provided guest house hospitality services
- Health sector businesses offered services in Pharmaceuticals and Optometrists
- Manufacturing businesses were mainly Ice cream producers and Paint manufacturers
- Construction sector businesses were building tender contractors.

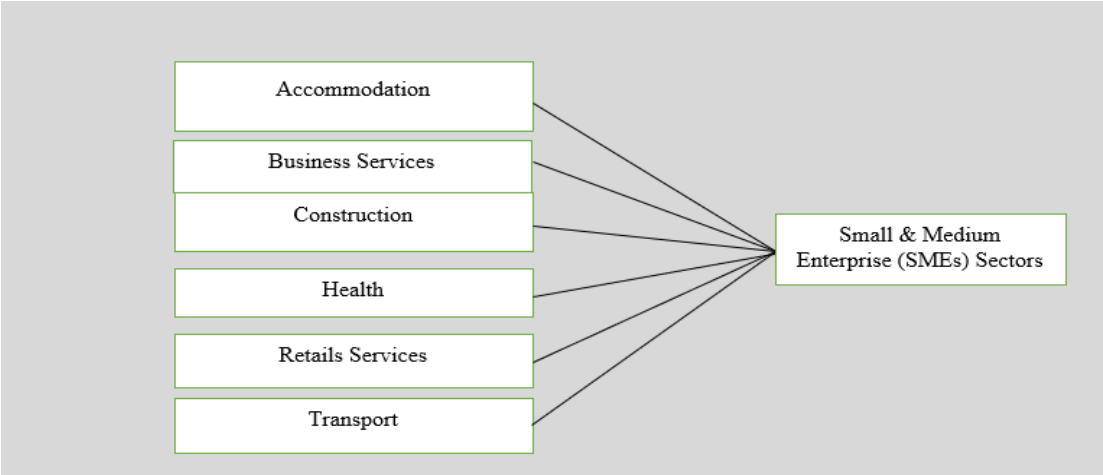

Figure 4.1*: *The SMEs' sectors involved in this study

Source: *Researchers Own Construct*

The letter represents COVID-19 impact (C) and ICT usage (I). For example, **01E4RCI** – respondent 01, Exempted Macro Enterprise, year, Retail, COVID-19 impact, and ICT usage. The researcher developed the designed codes to enable the reader to identify the patterns during the data analysis, reporting of findings and discussion sections. The respondent's sectors and years in operations were classified according to EMEs and QE categories of SMEs.

4.3 Classification of SMEs

Exempted Macro Enterprise	01E5ACI	02E5.6RCI	03E6TCI	04E3.4BSCI	05E4.6MCI	06E4HCI
	07E4.7RCI	08E4.9BSCI	09E5RCI	10R5TCI	11E2RCI	12E5RCI

Table 4.1: ***Respondents category: Exempted Macro Enterprise (EME) Business sectors***

Source: *Researchers Own Construct*

Exempt Macro Small Enterprises (EME) organizations have an annual turnover of ten million Rands or less.

Qualifying Enterprise	13QE7.9HCI	14QE8CCI	15QE6.7BSCI	16QE7RCI
	17QE5MCI	18QE6.5RCI	19QE9RCI	20QE12MCI

Table 4.2: Respondents category: Qualifying Enterprises (QE)

Source: *Researchers Own Construct*

Qualifying Enterprises (QE) have an annual turnover ranging between ten million Rands to 50 million Rands annually

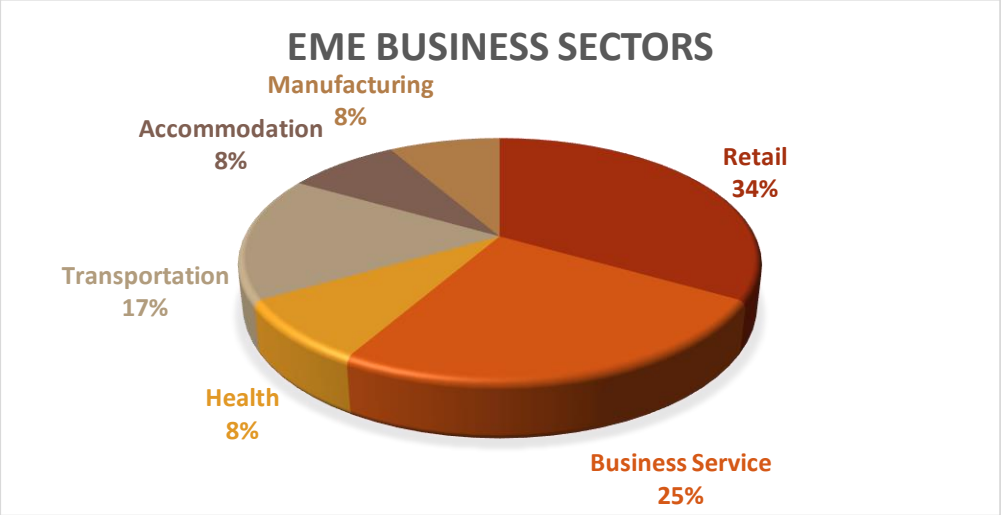

Figure 4.2*: *EME Business sectors

***Source**: Researchers Own Construct*

The chart above shows that the twelve (12) respondents who were interviewed from Exempted Macro Enterprises sub-sectors were distributed as follows: Retail (37 percent), Business Services sector (27 percent), Transportation (18 percent), Health (9 percent), Tourism (8 percent) and Accommodation sector (8 percent) respectively.

Figure 4.3: Respondent in the Qualifying Enterprises (QE) Business Sector

***Source:** Researchers Own Construct*

Figure 4.3 above shows the sectoral distribution of the eight (8) Qualifying Enterprise SMEs interviewed. The distribution shows an equal distribution of twenty-five percent (25%) for the Business Service sector; Retail and Manufacturing, respectively. While thirteen percent (13%) were drawn from Agriculture and twelve percent (12%) from Manufacturing respectively.

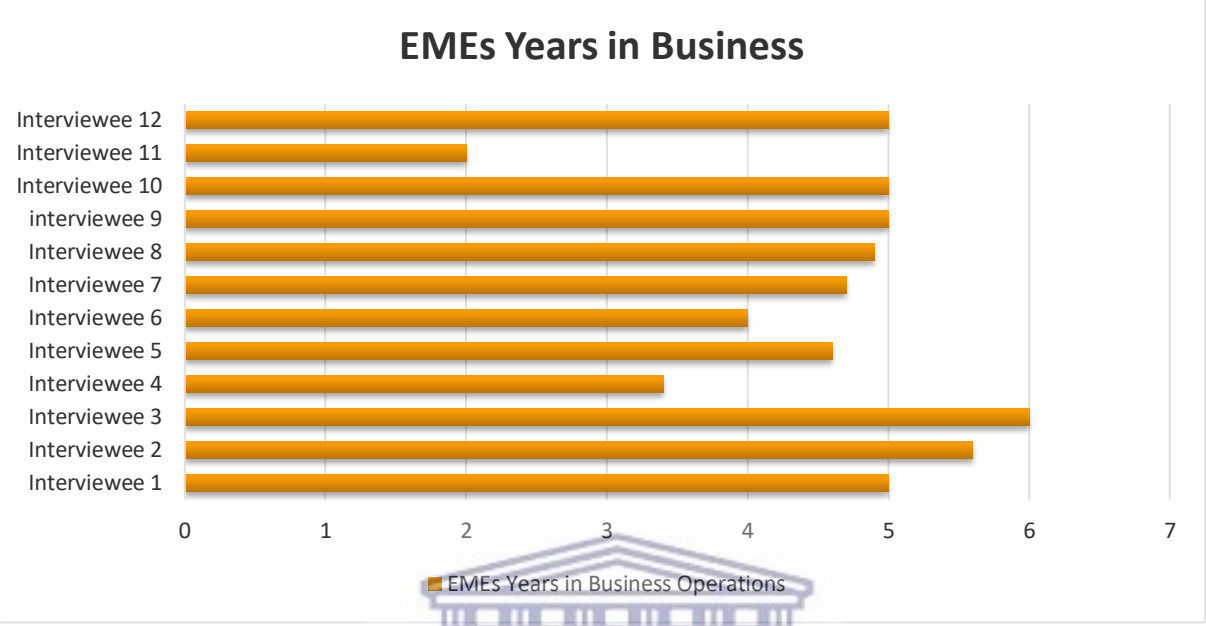

Figure 4.4: Emerging Macro Enterprises (EMEs) Years in Business

Source: *Researchers Own Construct*

Figure 4.4 Above indicates that the majority (90%) of the SMEs in the Emerging Macro Enterprises (EMEs) category had been in business for three (3) years and above.

Figure 4.5: Qualifying Enterprise (QE) Years in Business

Source: *Researchers Own Construct*

Figure 4.5 Above shows the majority (95%) of the SMEs in the Qualifying Enterprise sub-sector had been in business for six (6) years and above.

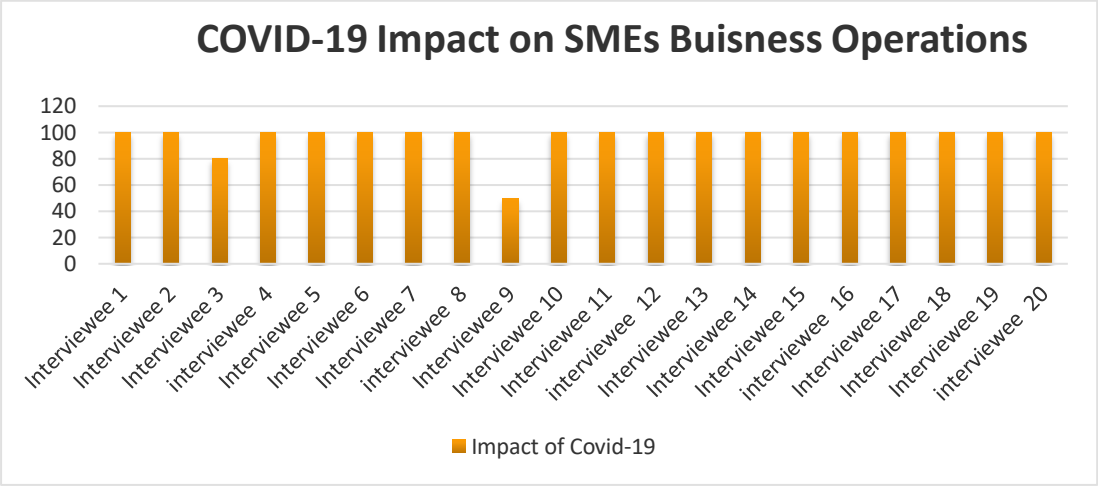

Figure 4.6: Impact of COVID-19 pandemic on Business Operations

Source: *Researchers Own Construct*

The X-axis represents Respondents' estimates of the level the COVID-19 impact measured in percentages (0%-100%) on SMEs' operations during the pandemic period.

Figure 4.6 Above shows that the majority (90%) of SMEs were severely disrupted in the aftermath of the COVID-19 pandemic lockdown restrictions. While 10% of Respondents from the Fast-food sub-sector (retail shops) reported that the emergence of Uber delivery services enhanced their business operations during the COVID-19 pandemic.

4.4. Findings

The main study research question was to understand the role of ICT in the operations of SMEs during the COVID-19 pandemic period. The theoretical understanding was interrogated in Chapter 1, while Chapter 3 presented the methodology and the rationale for content and thematic data analysis (Braun & Clarke, 2006). This section interprets key findings to gain an in-depth understanding of the nature and extent of ICT utilization by selected SMEs located in Cape Town during the Covad-19 pandemic period that started in March 2020. The primary findings are presented and discussed in the following sections.

4.4.1. ICT and Digital transition

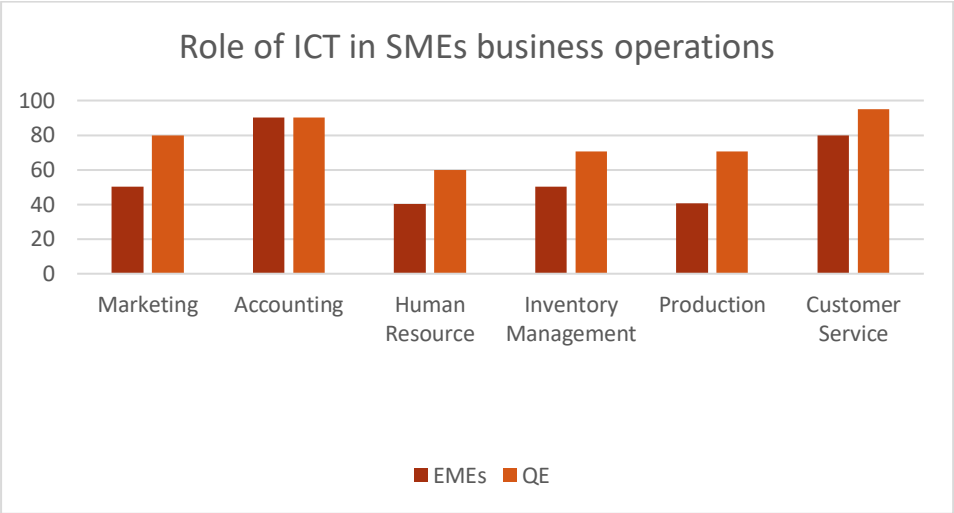

Figure 4.7: The focus of ICT in SMEs business operations

Source: *Researchers Own Construct*

The X axis indicates the percentage of the role of ICT within the respective SME business operations during the COVID-19 pandemic period. The Y-axis indicates the operational business area. Figure 4.7 above shows that SMEs adopted and utilised ICT in different business functional and operational areas during the COVID-19 pandemic period. The findings show that for the Exempted Macro Enterprise category, the majority (90 percent) of the SMEs focused on the utilisation of ICT on customer service and accounting business operations, while 10 percent focused on production-oriented functions. In turn, for the SMEs in the Qualifying Enterprises (QE) category, the majority (80%) utilised ICT towards Customer Service, Accounting and Marketing, while 20 percent focused on Human resources, Inventory, and Production-oriented functions.

The study findings on the utilization (adoption) of mobile payment services among SMEs support Cao (2021), who reported the growth in alternatives to cash payment for shopping during the COVID-19 pandemic. Kho *et al.* (2020) pointed out that Government support for SMEs in Malaysia supported the adoption of digitalization to improve product development and service delivery during the COVID-19 pandemic.

The majority of respondents (68%) from the Emerging Macro Enterprises SMEs reported the increased adoption and utilization of smartphones and digital payment methods during the COVID-19 pandemic. The primary focus was on customer service operations to enhance client

engagement, processing of cashflow transactions by the accounting department and marketing functions to sustain customer service delivery channels during the COVID-19 pandemic period. Most of the respondents stated that the utilization of ICT applications enabled them to respond to the restrictions on face-to-face interactions during the COVID-19 lockdown period.

The increase in the adoption and utilization of smartphones during COVID-19 was expressed by Respondent 02E5.6RCI) in the Fast-food business as follows:

> *"As the owner/manager of Fast-Food outlets (eateries), I have benefited from the use of smartphones during the pandemic. With the smartphone, I upload and display my menu, and receive online orders and locations for delivery. For instance, using the Uber Eats APP became popular during the pandemic, so I incorporated it into my business APP"*

Thirty-two percent (32%) of Qualifying Small Enterprises (QEs) reported increased utilization of laptops and Applications software (APP) to enhance business survival and continuity during the COVID-19 pandemic. The key advantages cited for utilizing these ICT resources were their mobility and portability. In addition, the respondents cited increased use of emerging social media APPs such as Facebook, LinkedIn and Twitter to enhance SMEs operations as they sought alternative online marketing platforms and channels for marketing their business offerings during the COVID-19 pandemic period.

Respondent 18QE6.5RCI, who is a retail grocery shop owner, stated the strategy as follows:

> *"During the COVID-19 pandemic, we utilised the online payment method to pay our distributors for goods and services supplied. Also, the order is being made using emails for Just-In-Time suppliers from the Manufacturers. This bridged the gaps as it helped enforce the distancing regulations and eliminated time wastage in my shop during the pandemic. Furthermore, using of laptops and an APP (check free) in our grocery shop helped in online shopping, which gives our customers a convenient and safer shopping experience."*

Similar observations were expressed by Respondent 13QE7.9HCI – a medical service provider that:

> *"ICT has revolutionized our medical service during the pandemic [through] using digital diagnostics and genomic devices, chat-bots, Ventilators, thermometers to check the temperature, and telemedicine. All these digital tools helped in reducing the risk of transmitting the virus."*

The study findings support observations by Brancombe (2020), who reported that ICT was adopted and utilised in most business operations during the COVID-19 pandemic period. Respondents cited different views on the role and impact of ICT on business operations during

the *"new normal*" COVID-19 environment. The majority of the respondents (69%) in the Emerging Macro Enterprises (EMEs) category stated that using ICT tools in the disruptive business environment enabled them to strategically reposition their businesses to become more agile, innovative and competitive. Respondent 11E2RCI, the owner/manager of a Butchery store, explained the benefits of ICT adoption and utilization during the COVID-19 pandemic that:

> *"ICT has simplified my ecosystem by eliminating time wastage; for example, I could place an order at my convenience and make payments using the APP on the smartphone. Indeed, the ICT tools are valuable and helpful during this pandemic and reduce the risk of spreading the diseases…"*

While 31% of respondents within the Qualifying small Enterprises (QE) category reported that ICT tools played a vital role in sustaining business operations through facilitating digital connectivity for enhanced service delivery and customer satisfaction. Respondent 19QE9RCI, who runs an Apparel factory outlet, stated the paradigm shift as follows:

> *"Digitalization and e-commerce have brought a paradigm shift and rapid development in our garment stores as it is the wheel that sustained the bus. We maintained inventory, sales, marketing, and supply chain in business operations, through social media such as Facebook, WhatsApp status, Twitter, smartphones, etc."*

The majority of the respondents in the study (75%) reported that smartphones and laptops powered by internet connectivity enhanced working remotely and enabled them to bridge the social non-contact and distance regulations enforced by the COVID-19 restrictions. Twenty-five percent (25%) of the respondents believed that e-payments eased the strategic transition from analog systems through the adoption of digital POS, Quick Respond codes, digital banking payment platforms and mobile money transfers, which collectively enhanced business continuity and competitive positioning during the COVID-19 pandemic period.

The transition to digitalization was cited by most of the study respondents as the game-changer that enhanced effective remote working and real-time virtual meetings and joint tasking using video/conferencing platforms. The strategic significance of digitalization was highlighted by Respondent 18QE6.5RCI - A retail store operator that:

> *"Migrating my business operations to digitalization using an internet-powered laptop has enabled us to create a website, emails, and social media where our company products are advertised on the livestreams, which came rapidly. Also, one of the staff members revealed ICT had allowed him to learn new skills…"*

The majority of the study respondents (72%) reported that ICT helped them to offer quality services and increase sales during the COVID-19 pandemic crisis. While 28% of the study respondents highlighted that ICT sustained business operations in the different sub-sectors of the economy through the adoption of 5G and related technological solutions. Respondent 12E5RCI- A Fast Food business owner expressed the viewpoint that:

> *"ICT impacted positively as there has been a high sales record since the adoption of online request and delivery…"*

Similarly, Respondent 14QE8CCI from the Construction sector pointed out that:

> *"ICT plays an essential role in making business operations efficient and promptly responding to customers' needs and smooth operations. Therefore, I believe all aspects of digitalization needs continuous investment…"*

The study findings highlight the significance of ICT during the COVID-19 pandemic period and how this enabled SMEs to work remotely and transform business process models in operational areas such as supply chain management, customer service delivery, accounting, and payment methods. The study findings echo MacGregor & Vrazalic (2006), who highlighted the imperative for digital upgrading by business organisations in the face of ever-changing environments. The findings support Vargo *et al.* (2020) on the enabler role of ICT in migration to online platforms during the COVID-19 crisis which created new opportunities that helped fast and swift business operations (Akpan *et al.*, 2020). ICT adoption enhanced agility, innovations, and competitiveness (Yang *et al.*, 2020), and enhanced the visibility of SME operations (Mutula & Van Brakel, 2006) as they navigated the turbulent and disruptive COVID-19 environment.

4.4.2. Re-alignment of Business Operations

Most of the study respondents (64%) reported that the focus on ICT utilisation is on building customer loyalty, trust and satisfaction during the COVID-19 pandemic period. While 26% stated that the adoption of ICT presented opportunities for developing new business models that focused on innovation in business operations despite the inherent prohibitive cost implications. Ten percent (10%) of the respondents highlighted that the adoption of ICT facilitated the migration to digitalization, giving them confidence and capacity to handle future acute disruptions to business operations.

Respondent 13QE7.9HCI summed the key outcomes of ICT-driven business re-alignment during the COVID-19 pandemic period as follows:

> *"Honestly, the critical factors of ICT impact have brought customer satisfaction to my business regardless of the cost implications and complexity during the pandemic. In addition, the transformation to the new business model also made me regret not having been onboarded to the online platforms prior to the pandemic…"*

Most of the respondents (66%) reported that the adoption of ICT during the COVID-19 pandemic period involved complex and urgent tasks of migrating to the online platform which enabled them to improve business operational scalability in a short space of time. While 34% cited successful transition and migration of business operations to the Cloud platform supported by Artificial Intelligence (AI). The majority view was that ICT-driven migration to online platforms facilitated rapid automation and harnessing opportunities and created exponential advancements through technologies that intelligently improved quality and efficient workflows throughout business eco-systems.

Respondent 20QE12MCI, the owner of a Wine Business Producing business, expressed the key benefits as follows:

> *"My most significant success was reinventing my business operations to the new business model as the pandemic dramatically pushed all businesses to online channels…"*

Similarly, Respondent 08E4.9BSCI, a business owner in an event plaining pointed out that:

> *"The most outstanding value of navigating the turbulent environment is online visibility empowered by ICT which has brought tremendous growth to the business…"*

The study findings support observations by Ramírez & Selsky (2016) on the significance of ICT in overcoming traditional strategy models during periods of unpredictable environmental changes. Further, Kraus *et al.* (2020) cited the important role of ICT in the migration to online channels and subsequent enhancement of innovation to increase performance, competitiveness and agility, which improve business operational success

Despite the positive contribution of ICT to business survival during the COVID-19 pandemic, most of the respondents cited the challenges posed by the disruptive effects of the electricity load-shedding and growing incidents of cybercrimes. These two were cited as factors that

threatened the survival and growth of business organizations during the COVID-19 pandemic period in the Western Cape, South Africa.

Respondent 17QE5MCI, an owner of a Manufacturing company, echoed the sentiments as follows:

"All SMEs have embraced ICT because of the negative experience of the pandemic. We could not have survived the pandemic if ICT migration had not been available. However, in South Africa, SMEs have identified that the two ICT challenges facing us are the load shedding from Eskom, which crumbles our business immediately after the lights go out. Secondly, we want the IT team to guarantee data security from cybercriminals…"

4.4.3. ICT Inertia Pre-COVID-19 Pandemic

Most of the respondents in the EMEs category (65%) reported that the main ICT tools used prior to the COVID-19 pandemic were telephones and Point of Sale (POS) machines for business transactions. While 35% cited prior to COVID-19, social media such as Facebook, Twitter, Instagram, etc., were used. For Qualifying Enterprises (QE), most of the respondents (65%) reported that the main ICT tools in use during the pre-COVID-19 included smartphones, desktop computers, scanners, card machines/POS, and modems or WiFi. While 35% stated, they mainly relied on ICT tools such as laptops, email, and web conferencing.

Respondent 09E5RCI, who runs a Retail – Tailoring shop, cited the situation pre-COVID-19 as follows:

"Before the massive health crisis that disrupted our normal lifestyle, I had a telephone device that I conveniently used to reach my clients and vendors for order placement or procurement…"

While Respondent 20QE12MCI in the Ice Cream manufacturing sector reported the ICT resources available pre the COVID-19 pandemic as follows:

"With internet access, we had ICT infrastructures limited to a desktop computer, scanner, printer, and POS before the COVID-19 pandemic…"

The findings support observations by Wilkinson & Michelle (2018) and Zhang *et al.* (2020) on pre-COVID-19 pandemic ICT tools in SME business operations mainly comprised of computer desktops, telephones and POS machines.

4.4.4. ICT Skills Deficit

All the respondents in the study reported that they relied on on-the-job training and outsourcing ICT training to navigate the COVID-19 pandemic environment. They reported that the process was difficult and costly as they hastily adopted ICT tools to enable remote working and re-configure business operations and working modalities. The challenges faced during the transitional and adaptation process were summed-up by respondent 14QE8CCI, an Owner/manager of Administrative Service in the Construction Sector, as follows:

> *"During the pandemic, navigating to the online platform was challenging and required training as some of the applications were hard to learn because they are relatively new skills. However, my staff and I engaged in different learning and training exercises to introduce systems such as the Cloud-Based system, an account package for payroll. Also, completing our Tender/RFQ was challenging as the City of Cape Town migrated the Tender application to an online platform which requires training. As a result, the City of Cape Town outsourced the training to "The Business Associate, a consultancy firm," to train all SMEs because COVID-19 created unprecedented demand for online platforms…*"

Respondent 10R5TCI, an e-hailing service provider (inDriver), as follows:

> *"The in-driver APP downloaded on my Smartphone was problematic for me because of its technicality. For instance, I was cancelling a rider instead of accepting a ride because of the peculiarity of the APP…"*

The findings support Bvuma & Marmewick's (2020) that ICT training requirements within the SME ecosystem to enable the acquisition of new skills, as ICT tools are often complex even though they align with business operations within dynamic business environments.

4.4.5. Business Digital Readiness

Most of the respondents (75%) within the Exempted Macro Enterprise (EME) category reported that they mainly adopted digital payment and cash machines using POS, QR codes, and card machines, which increased the use of credit and debit cards for fast and timely flexible payments. Respondents also cited the increased use of smartphones in their business operations to access internet networks such as WiFi, data and downloading Applications (APPs) during the COVID-19 pandemic period. Respondent (03E6TCI), an e-hailing service provider (Uber driver) in the Transportation Sector, pointed out that:

> *"E-hailing service (Uber) is an outbound logistic business model that operates with an internet-connected mobile device (APP). During the COVID-19 pandemic, I adopted a smartphone to download Uber APP as a new user to register on the Uber platform, enabling me to get ride requests through the*

mobile APP. Furthermore, the usefulness of my smartphones during this disrupted environment has made me explore the adoption of ICT, as my initial thought on smartphones was for show-off…"

While twenty-five (25%) of respondents within the Qualifying Enterprise (QE) category reported that they mostly adopted and utilised broadband cellular networks for universal connectivity, laptops for staff working remotely and APP development. Most of the respondents pointed out that the utilisation of networks enabled them to digitally refocus and accelerate responses from clients and suppliers, which enhanced the efficient functioning of business operations during the COVID-19 pandemic period.

Respondent 13QE7.9HCI} in the Health Sector (Eye Doctor) stated this trend as follows:

"The most used ICT tools are the laptops that enable us to work remotely. We adopted the online developed Application software such as NupayAPP for scheduled debit orders, Ocumail for reports, and Latepoint for appointments. In addition, our accountant activated electronic payments on all our customers for monthly payments. Therefore, we quickly provided laptops to our staff with a desktop system for business continuity…"

The extent and degree of digital readiness determined the speed with which different SMEs adopted digitally driven ICTs tools during the COVID-19 pandemic period. Most respondents (70%) reported that digital readiness was critical for customer service/delivery and marketing during the COVID-19 pandemic period. While 30% of the respondents highlighted that ICT training for staff to be conversant with the new normal environment was a worthwhile continuous investment. The findings resonate with Cao (2021), who reported that e-payment and the use of digital gadgets enhanced SME business operations during the COVID-19 pandemic period.

4.4.6. Loss of Revenue

The majority of the respondents (75%) within the EME category pointed out that the impact of COVID-19 resulted in the loss of sales, business contracts, production continuity, and temporarily shutting down of operations. However, 25% of respondents in the Qualifying Enterprise (QE) category cited lost demand and revenue, staff layoffs, supply chain constraints and cash flow problems during the COVID-19 pandemic.

Some of the challenges encountered during the COVID-19 pandemic period cited by Respondent 01E5ACI, a Guesthouse owner/manager, are that:

"Our Guesthouse is a family-owned business that offers 30% employment in the sector in Cape Town, South Africa, which was temporarily closed during the pandemic. This was the most challenging situation encountered due to the Government regulations on movement. As a result, all our guests were repatriated to various states and countries because our Guesthouse accommodated local and international businesspeople..."

Similar views on business disruptions were expressed by a Consultant in the Business Service sector (Respondent 15QE6.7BSCI) that:

"The impact of the pandemic shuddered the business operations, and the most significant challenges were the loss of projects and clients, especially projects from the government that were suspended. In addition, our business faced financial crisis and inability to pay staff salaries. These are the difficulties caused by the COVID-19 pandemic..."

The study findings support Kumar *et al. (*2021) and Winarsih *et al.* (2020), who cited viability challenges due to abrupt business closures, loss of contracts and employee layoffs during the COVID-19 pandemic period and the vulnerability of SME business operations.

4.4.7. Financial Fragility

Most of the respondents (82%) in the study reported that the abrupt nature of the national and global lockdowns made transiting to the "new normal" environment difficult as businesses had very little financial reserves and limited access to finance. While 18% of the respondents stated that they were able to quickly embrace digitalization to exploit new opportunities that emerged in the new COVID-19 business environment. They stated that they allocated meager financial resources towards acquisition and investment in digital tools and infrastructure such as 5Gs networks, online payment platforms, Artificial intelligence, and 3D printing (Dubey, Gunasekaran, Childe, Bryde, Giannakis, Foropon & Hazen, 2019).

The challenges of limited financial resources in managing change and transition to the new COVID-19 pandemic environment were echoed by Respondent 06E4HCI}- A Medical provider that:

"The use of digital tools in providing services enhanced performance. However, my first experience using a ventilator and Vitro Diagnosis device was challenging and complicated…"

The lack of funds to finance and support the migration of business operations to the emerging digital world was cited by most of the respondents (60%) in the Retail and Business Service sectors. They further explained that financial fragility frustrated efforts to adapt and align

business operations to the COVID-19 pandemic-driven disruptive environment. While 25% of SMEs in the Transportation, Health, and Accommodation sub-sectors highlighted the challenges of bridging the knowledge gap were due to a combination of lack of funds and ICT skills. While 15% of the respondents cited severe financial constraints that limited the ability to bridge the digital skills and knowledge gaps during the COVID-19 period.

Respondent 19QE9RCI, owner of an IT Shop outlet highlighted the situation as follows:

> *"Financial fragility has been a significant problem facing SMEs before and during the COVID-19 pandemic. The most critical challenge for my business was acquiring laptops to enable my workforce to work remotely due to financial incapabilities and cost-effectiveness..."*

The study findings support observations by Amankwah-Amoah *et al.* (2021) on the need for SMEs to access funding for re-organizing in response to the challenges posed by the COVID-19 pandemic environment. The study findings resonate with Priyono *et al.* (2020) on challenges faced by SMEs to reinvent in the midst of limited finance and knowledge gaps. Further concurring with Kniffin *et al.* (2021) on the role played by ICT in redefining, reconfiguring, and disaggregating businesses to accelerate the value chain productivity through automating procedures during the COVID-19 pandemic period.

4.5. Discussion and Interpretation of Findings

4.5.1. Interpretation of Findings

The study findings were analysed and interpreted, drawing from the key themes which emerged from the data analysis. The discussion and interpretation are presented below.

4.5.2. Role of ICT in SME Operations during COVID-19 Pandemic

The study findings showed that SMEs were not digitally ready for the ICT-driven transition, which was critical for alignment with the changes in the COVID-19-induced environment which imposed global lockdowns and restricted movements. The challenges were largely due to lack of ICT investments pre-COVID-19, as most SMEs had mundane technological devices for processing communication and transactions information using basic ICT tools such as telephones, desktop computers, scanners, printers and internet modems (Wilkinson & Michelle, 2018; Zhang *et al.*, 2020). In addition, the pre-COVID-19 ICT infrastructure, hardware and software systems were primarily designed or developed to collect data for processing,

transmission, and storage to execute and automate specific business functions (Kurniawati, 2020).

The on-set of the COVID-19 pandemic required SMEs to re-think and reinvent the ICT applications at the respective general-user, production-integration, or market-oriented respective user requirements (Lucchetti & Sterlacchini, 2004). Thus, the general-user oriented SMEs that had essential technologies, such as telephone, email, and Internet to conduct administrative functions needed to upgrade the ICT functionality and applications to align with the demands of the new COVID-19 pandemic business terrain. While production-integration oriented SMEs where ICT is tightly coupled with the functionality of the business production of goods had equal challenges for adapting to the 'new normal'.

For the market-oriented SMEs, the use of ICT focussed on marketing or communicating with customers and outside world, and they needed to align the ICT and digital platforms for the new environment (Taiminen & Karjaluoto, (2015). The study findings indicate that most of the SMEs in the study were at the general-user level relying on ICT technologies and relied on ICT tools such as telephone, email, and Internet, to carry out administrative functions (Lucchetti & Sterlacchini, 2004).

The ICT applications at the general user level focus on processing mundane transactions rather than as transformation tools for business alignment that enhance market competitiveness (Ng, Kee, & Ramayah., 2016) and value-addition innovations to improve business operations (Priyono *et al.*, (2020); Mwila & Ngoyi (2019). Most of the SMEs in the study cited limited availability and utilisation ICT resources prior to the COVID-19 pandemic. At the inception and during the COVID-19 pandemic, most of the SMEs migrated from the traditional telephones and point of sale (POS)/card machines to digital platforms for online business transactions and social media platforms such as Twitter, Instagram, Facebook etc., for marketing and hardware that included smartphones, Scanners, and modems and WiFi.

4.5.3. ICT Adoption during the COVID-19 Pandemic

The study findings indicated that SMEs adopted and upgraded ICT resources and infrastructure through digitalization of operating systems as they aligned to the 'new normal' to mitigate the

threats and disruptive effects of the COVID-19 pandemic to business continuity and survival (Cuschieri, 2020). The ICT adopted by SMEs in the study include a wide range of ICT hardware and software suitable for their respective lines of businesses, such as artificial intelligence, Smartphones, mobile technology, the Internet of Things, Cloud Computing, 3D scanning/printing, social media platforms, and Big data and data analytics (Javaid, Haleem, Vaishya, Suman & Vaish, 2020). Equally, the SMEs adopted digitalised-based services to communicate and work remotely in conducting business operations such as marketing, accounting, customer delivery, inventory management, production, and procurement departments (Brancombe, 2020).

The SMEs in the study cited the severity of the disruption of business operations due to the COVID-19 pandemic as governments imposed stay-at-home and social distancing restrictions and lockdowns (Gregurec *et al.,* 2021; Sahoo & Ashwani, 2020). In the face of the disruptive COVID-19 business environments, SMEs in this study reported that they needed new competencies and knowledge on how to adapt to the new normal and developing adaptive business ecosystems driven by digital technologies to reconfigure business models for survival and business continuity (Gregurec, *et al.*, 2021).

At the on-set and during the COVID-19 pandemic period, most of the SMEs in the study had to implement sustainable business modalities in order to align with the new environment (Amankwah-Amoah, Khan, & Wood, 2021). Some of the key challenges that compelled them to adopt new ICT tools and infrastructure were the global travel restrictions and the global enforcement of restrictive working procedures to prevent the transmission of the virus, which eroded their capacity to sustain operations and jobs as they lost significant business opportunities (Kumar *et al.,* 2020; Saluja, 2012; Bachtiger *et al.*, 2021).

The ICT-driven innovations reported by most of the SMEs in this study include digitalization that enhanced effective remote working by the workforce and alignment of business operations to the online digital models and platforms. Further, the SMEs had to shift business paradigms and adopted ICT that enhanced the transformation of organizational strategies and operations (Li, 2018). In the midst of threats to business survival and continuity precipitated by the COVID-19 crisis, ICT propelled the business transformation and paradigm shift from offline to online systems and platforms (Vargo *et al.,* 2020).

The study findings concurred with observations by Richter (2020) on the role played by digitalization towards quick connectivity and responsiveness to the new business environment. Thus, ICTs played a pivotal role (Yang *et al.*, 2020) and enhanced agility, innovativeness, and competitiveness within the dynamic COVID-19 pandemic "new normal" business ecosystem. ICT emerged as a fast solution (Vargo *et al.*, 2020) for SMEs in the study as they responded to the unprecedented global economic crises which impacted human behaviour and thorough regulations on physical distancing and quarantines.

4.5.4. ICT and Re-alignment of Business Operations

The adoption of ICT enhanced the capacity of SMEs in the study to craft new strategies (Ramírez & Selsky, 2016) that enhanced the ability to align with the turbulence and uncertainty in the COVID-19 pandemic global business environment. The major re-alignment strategies included investments in new ICT platforms and launching online channels that enhanced innovations in business operations, competitiveness, and agility during the COVID-19 new era (Kraus *et al.*, 2020).

Some of the key decisions that SMEs had to consider related to migration from ICT general-user status traditionally focused on basic technologies, such as telephone, e-mail, and the Internet to the digitalisation. For production-integration ICT users, the focus was upgrading the tightly coupled between ICT and production systems and methods, while market-oriented strategies had to be ICT-driven to enhance marketing communicating with the outside world (Lucchetti & Sterlacchini, 2004; Taiminen & Karjaluoto, 2015).

Most of the respondents reported that the migration to online platforms improved operational scalability. Further stating that transition and migration to the Cloud platform supported by Artificial Intelligence (AI) enabled automation and utilization of exponential technologies that improved the quality and efficient workflows throughout the business ecosystems. The study findings support observations on the migration from general users to production and marketing-oriented ICT applications (Lucchetti & Sterlacchini, 2004; Taiminen & Karjaluoto, 2015) during the COVID-19 pandemic period.

4.5.5. ICT and Business Competitiveness

The adoption of ICT enabled SMEs in the study to develop and implement new business models that enhanced customer service, satisfaction, and retention during the COVID-19 period. The study findings support Yang *et al.* (2020), who cited the pivotal role played by ICT towards enhancing performance, growth, expansion, and introduction of new products and services and improved customer satisfaction during the pandemic period (Consoli, 2012). Most of the respondents reported that the adoption and utilization of ICT during the COVID-19 pandemic enhanced business flexibility and facilitating business transactions, thereby overcoming the lockdown-imposed barriers (Manochehri, Al-Esmail & Ashrafi, 2012). The study findings support Kraus *et al.* (2020), who reported the accelerated usage of ICT, digitalization, and innovative methods to ensure business continuity during the disruptive COVID-19 pandemic period.

4.5.6. ICT and Innovation in the SMEs operation

Most of the SMEs in this study reported successful transition and migration of business operations to drive innovation and automation supported by Cloud platforms and Artificial Intelligence (AI). Innovation is a tool an entrepreneur uses to influence and accelerate in exploiting business opportunities in changing business environments (Drucker, 1985) was evident in this study. For example, business owners in the Wine Business Producing sector reported that the transition to new business models opened new online marketing channels and business opportunities.

While an SME owner in Events Management highlighted that the ICT-driven transition enhanced online visibility and business growth during the COVID-19 pandemic period. Thus, the implementation of ICT by SMEs in the study during the pandemic enhanced customer satisfaction, business efficiency, and the ability to offer a range of innovative services (Walsh, 2020). The findings support observations by Hamburg (2021) on the significance of ICT in the transformation of business organizations and value creation in response to changing environments.

4.5.7. ICT and Customer Service Delivery

The study findings indicate that SMEs migrated to online platforms and digital spaces to offer innovative services during the COVID-19 pandemic 'new normal environment.' Thus, ICT enabled SMEs to provide services that aligned with the new customer behaviours, market structures, and constrained supply chains during the COVID-19 pandemic period (Carvalho *et al*., 2020). The SMEs were able to deploy ICT towards building resilience through restructured business models and competencies in order to satisfy new customer demands via the online shopping landscape (Sandberg *et al.,* 2020).

In many ways, the study findings indicate that most SMEs utilised ICT to open and accelerate channels for reaching and building customer trust, empathy, and quality service delivery (Ceylan *et al.,* 2020). The main ICT tools and resources used to develop digital marketing, sales, and service delivery platforms leveraging Artificial Intelligence and diverse software and IT application platforms.

Further, ICT facilitated the repositioning of relationships between customer expectations and business reality during the periods of uncertainty. However, some of the SMEs in the study were of the view that they should have adopted ICT way before the COVID-19 pandemic. Further supporting the observations by Butt (2020), who reported that organizations regretted the delay in adopting ICT to transform and integrate business operations prior to the COVID-19 pandemic period.

4.5.8. ICT and Agility in SMEs Business Operations

The adoption of ICT enabled SMEs in the study to respond timely to the COVID-19-induced lockdowns and remote working restrictions. The key agility strategies cited by respondents include migration to digitalization within a short space of time, re-engineering and re-positioning business operations and processes to respond speedily, efficiently, and effectively which ensured business continuity during the COVID-19 pandemic period (Baldwin, 2019). The findings show that the success behind the swift paradigm shift by the SMEs in the study was anchored on adopting and implementing new ICT tools and resources leveraging on the internet and related gadgets for online communication and transactions (Wilen, 2020).

The study findings support observations by Kniffin *et al.* (2021) on the role played by ICT in redefining, reconfiguring, and disaggregating business processes toward value creation through

innovation and automation during the COVID-19 pandemic. Overall, most of the SMEs in the study responded speedily to the COVID-19 pandemic through accelerated adoption and implementation of ICT to transform business operations which in turn enhanced organizational agility in the fast-changing business environments (Serrat, 2021).

4.6. Challenges Faced in ICT Adoption

SMEs in the study reported that they faced challenges with the transition and migration to ICT and adoption in business operations. Some of the key challenges are discussed below:

4.6.1. ICT Preparedness & Skills Deficit

Most of the SMEs reported lack of investment in ICT tools and infrastructure in the pre-COVID-19 period as they mainly relied on telephones, smartphones, Desktop computers, Scanners, card machines/POS, and modems or WiFi for business transactions. Some of the SMEs stated that they had to invest in laptops, enhanced email communication, and web conferencing tools, and social media during the COVID-19 pandemic period. The study observations support Bvuma & Marmewick (2020) on challenges faced by SMEs in adopting ICT, including lack of knowledge and affordability.

The lack of ICT preparedness pre-COVID reported in the study highlighted a limited understanding of the benefits of e-commerce (Al-Alawi & Al-Ali, 2015). Ramdansyah & Taufik (2017) reported that the significance of e-commerce and its role in SMEs depends on top management support and foresight on unforeseen benefits. The consequence of the lack of ICT preparedness echoes observations by Oktora *et al.* (2020) on how the COVID-19 pandemic shipwrecked SMEs operations in Indonesia and intervention by the Malaysian government to support and push SMEs to adopt digital platforms for business alignment.

The combination of lack of knowledge on the role of ICT and skill deficits contributed to the challenges faced by SMEs in the study at the inception and during the COVID-19 pandemic period. The study findings indicate the critical need for SMEs to invest in staff education, ICT expertise, building technology-driven cultures, knowledge and harnessing ICT tools to enhance business competitiveness (Modimogale & Kroeze, 2011). Some of the keys that require

attention by SMEs include continuous investment in ICT resources, internet integration, e-sales and e-procurement systems, knowledge and visionary leadership (Giotopoulos *et al*., 2017).

4.7. Summary

This chapter presented the data analysis, main findings, discussion, and interpretation of the results. The analysis showed how different SMEs drawn from diverse sub-sectors adopted ICT during the COVID-19 pandemic period. The main findings indicated the role played by ICT in the business operations and the challenges impacting the investment and utilisation of ICT in SMEs during the COVID-19 pandemic period.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

The chapter presents the conclusions, recommendations, limitations, and propositions for future research. The main research question was to explore the role played by ICT in the operations of selected SMEs located in Cape Town, Western Cape of South Africa, during the COVID-19 era. This chapter draws out the main conclusions on the significance of ICT in the business operations of SMEs in the study. The recommendations for policymakers, practitioners, and future research are presented as well as the study limitations.

5.2. Conclusions

5.2.1. Conclusion on Research Question 1

RQ1: *How did SMEs utilize the ICT resources during COVID-19 pandemic in Cape Town?*
The SMEs were ill-prepared and ill-equipped to transition to ICT-driven business operations at the inception of the COVID-19 pandemic in March 2020. Most of the SMEs were at the general-user level (Lucchetti & Sterlacchini, 2004) at the onset of the COVID-19 pandemic. The condition of the ICTs tools such as desktop computers, mobile phones, scanners, and laptops among some SMEs was not internet-connected while others either had ICT tools. These challenges caused them to react differently in response to the abrupt and disruptive global lockdowns and restrictive regulations on human movement, and subsequent remote working 'new normal' requirements. The main conclusions are that SMEs in the study faced significant challenges and loss of business in the process of adopting variable levels of ICT and digitalization during the COVID-19 pandemic period. However, technological acceptance of ICT was a game-changer in their business operations.

5.2.2. Conclusion on Research Question 2

RQ2: *What was the role of ICT in SMEs business operation during the COVID-19 pandemic?*

The ICT resources and infrastructure requirements and cost implications varied by sub-sector. Thus, for some SMEs, the acquisition of a smartphone and related software were game-

changers, while others required relatively complex ICT resources and infrastructure to effectively transition from the traditional manual and semi-ICT platforms at the inception and during the COVID-19 pandemic period.

The main constraints faced in the SMEs' acquisition and utilization of ICT in business operations included lack of investment in ICT prior to the beginning of COVID-19, which exposed most of the SMEs. Inadequate financial resources and ICT-skill deficits in most of the SMEs added to the challenges of timely response to disruptions in the business environment. Thus, the piecemeal and 'forced' investments in ICT may have cost some of the SMEs market share and competitiveness. Thus, the 'learning curve' was steep for some of the SMEs as they scrambled to acquire the necessary ICT resources and infrastructure for the respective digitally based innovations in production, transactions, and marketing business operations during the COVID-19 pandemic period.

5.2.3. Conclusion on Research Question 3

RQ3: *What factors influence ICT tools adoption and alignment with changes in the COVID-19 business environment?*

Broadly SMEs were faced with deficiencies in ICT skills and knowledge that may have even resulted in some of the SMEs investing in sub-optimum ICT tools in response to the pandemic. Overall, most of the SMEs adopted reactive rather than proactive strategies with respect to the adoption of ICT as they faced steep learning curves compounded by limited financial resources and the absence of government support.

5.2.4. Overall Conclusion on the Study

Overall, the SMEs in the study, for the reasons cited above, variably adopted and implemented ICT to reconfigure production and marketing processes (Lucchetti & Sterlacchini, 2004). The SMEs also leveraged on Cloud computing services, new ICT tools, and stable internet connectivity to migrate critical to digital and online platforms to align business operations. These were aligned and guided by the dictates of restricted human movement, social distancing, and health-related protocols such as wearing face-masks, limited numbers allowed, and modified strategies as and when the restrictions were revised. The cumulative effects of the disruptive nature of the COVID-19 pandemic compelled SMEs to adopt variable levels of ICT

application in business operations, transactions, and marketing communications to enhance their chances of survival and competitiveness during the COVID-19 pandemic period.

5.3. Implication of Theoretical Framework

The study findings confirmed the Technology readiness/acceptance model (Parasuraman, 2000). Technology readiness speaks to the acceptance of ICT usage that comes with perceived usefulness in improving business operations. The SMEs interviewed concurred that they perceived the usefulness of ICT for their business operations during the COVID-19 pandemic's disruptive business environment. Thus, ICT presented opportunities to align business operations to the dictates of the 'new normal' environment.

5.4. Recommendations

The recommendations focus on building a resilient SME ecosystem in readiness for future unpredictable, disruptive crises with similar and probably severe consequences than the COVID-19 pandemic.

5.4.1 Developing ICT and digitally resilient Small and Medium Enterprises (SMEs)

- **Government-Supported ICT Audits in SMEs**

  The contribution of the SME sector towards employment creation and poverty reduction has been widely reported in the literature (e.g., Lawal *et al.,* 2016; OECD, 2017). The COVID-19 pandemic, in many ways, demonstrated that ICT is a critical success factor for the resilience and survival of SMEs during the COVID-19 pandemic crises. Thus, the need for governments to proactively evaluate and audit the ICT readiness of the SME ecosystem in anticipation of future environmental disruptive crises. There is also need for regular audits and benchmarking by SME associations and relevant government departments and stakeholders to assess whether the ICT tools and resources are fit-for-purpose within the respective subsectors. This will capacitate the SMEs to keep up with the digitalization trends, which is critical for alignment with unpredicted future crises (Selah, 2020). The audits will highlight the strengths and weaknesses in terms of ICT infrastructure and human skills capacity in SMEs. Possible strategies

include conducting regular training, if not mandatory, training for SMEs as a qualifying measure for accessing loans, rebates, and related services.

- **Acquisition of ICT Tools and Resources**

SMEs should continuously upgrade ICT tools and resources to full-proof themselves against future crises such as the COVID-19 pandemic. The COVID-19 pandemic demonstrated that low ICT utilisation posed serious viability and survival challenges for SMEs, evidenced by abrupt business closures, loss of customers, supply chains, and employee lay-offs (Kumar *et al.,* 2021; Winarsih *et al.,* 2020). Furthermore, there is a need for the government and related SME stakeholders and associations to draw lessons from the COVID-19 pandemic and proactively support the ongoing ICT capacity and digital readiness of the SME sector.

5.4.2 Alignment of SMEs Operational Strategies with ICT Innovations

There is need for proper implementation and application of ICT applications and technologies that transform businesses and productivity (Zhuming & David, 2015). Therefore, the SME sector needs alignment between business strategies and ICT and enhance the embedding of innovation cultures within the SME eco-system. The study findings show the significance of ICT training and preparedness to mitigate the challenges posed by pandemic-induced disruptive business environments.

- **ICT Training for SMEs**

One of the biggest challenges in the adoption of ICT by SMEs is the lack of skills, knowledge, and coping with the complexity of ICT utilisation (Modimogale & Kroeze, 2011). There is need for continuous ICT training in digital skills and relevant ICT applications, innovations, creativity, and business models within the SME sector. Notwithstanding the limited human resources in some SMEs, ICT training should be conducted at all levels. The government and stakeholders should actively support ICT training in SMEs.

- **Financial Management**

Financial fragility pressures tend to be extreme for SMEs during periods of unforeseen global crises in the business environment, which threaten business continuity (Acs *et al.*, 2016)., Thus, the need to enhance financial management capacity in the SME sector to minimize the impact of shocks from the business environment as experienced during the COVID-19 pandemic period. The government and key stakeholders should support SME training in areas of financial literacy and management.

5.4.3 Embedding ICT in SME Business Ecosystems

The COVID-19 pandemic exposed the inadequate integration of ICT with business operations in SMEs. There is a need to continuously improve the underlying factors underpinning the SME ecosystem. Key stakeholders and players need to draw lessons for building resilient ICT integration and compatibility within and among the players. Thus, the importance for the SME sector to achieve robust integration of ICT resources and applications across business operations. ICT resources and tools revolutionize the development of adaptative value creation and delivery ecosystems (Kergroach & Bianchini, 2021). The government and key stakeholders should support and promote the ICT ecosystem's integration by enabling ICT-driven linkages between all the key players in the SME sector. Some of the key focus areas for integrating the SME ecosystem include ICT applications such as e-booking and orders, social media platforms, customer relationship management, electronic invoicing, cloud computing, e-commerce, and supplier-customer management in the business operations of SMEs.

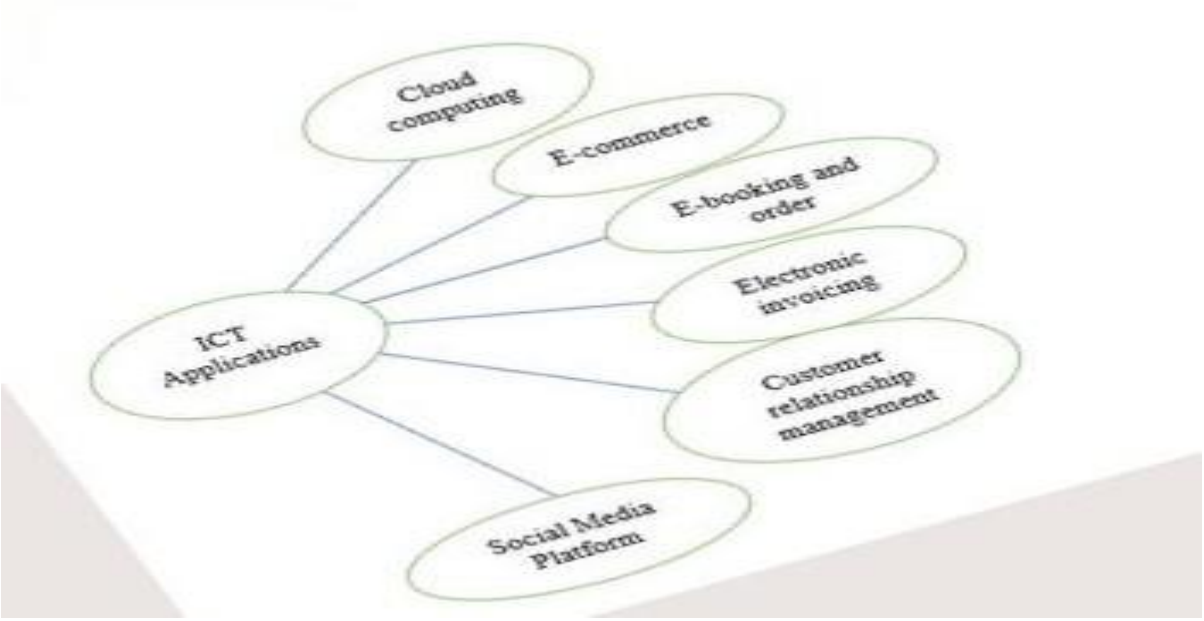

Figure 5.1: ICT Methods incorporated in SMEs Business Operations

Source: The researcher own construct

- **ICT Driven Innovation in SME Business Operations**

ICT applications and tools created opportunities for remote electronic, seamless, and secure interaction between business organizations and customers as well as with suppliers and external stakeholders. In addition, the digitalisation of business operations through the elimination of manual data processing bridged the social distancing restrictions. Thus, key stakeholders and the government need to incrementally innovate business systems, products, and service delivery strategies drawing from the COVID-19 experiences within the SME ecosystem. Furthermore, SMEs need to invest in ICT resources and infrastructure that supports the development of innovative business systems and processes in areas such as customer service delivery, inventory, accounting, production, and business performance for business growth.

The COVID-19 pandemic became a game-changer as it imposed radical rethinking of business models that led SMEs to implement intelligent working solutions for business continuity at short notice despite the lack of preparedness (OECD, 2020).

5.5 Future Research

The study findings have enormous potential to be valued by other researchers in understanding the role of ICT in the operations of SMEs during the COVID-19 era. In this regard, future research should examine areas such as the role of ICT in SMEs post-COVID-19 and the impact on business operations. In addition, there is a need for comparative studies on the adoption and utilization of ICT within the SME sub-sectors to highlight similarities and differences and draw lessons and way forward for SMEs. Furthermore, future studies should focus on the factors influencing SMEs' readiness to cope with crises akin to the COVID-19 pandemic and develop scenarios for the different SME subsectors.

5.6 Limitations of the Study

The dissertation's main limitations were cost and time, which confined the research setting to the Blackheath Industrial Area in Cape Town. Comprehensive coverage might have yielded different insights into the research outcomes. The constraints of the prevalent COVID-19 pandemic during the period the study was conducted restricted the researcher's mobility and curtailed observations and in-house tours of SME premises.

5.7 Summary

The chapter presented the study's conclusions and recommendations. The main conclusions were that SMEs in the study variably adopted, and utilised ICT in business operations amidst internal constraints such as mundane ICT resources, limited finance and ICT skills deficits during the COVID-19 pandemic. The key recommendations highlighted the need for ICT training, incorporation of ICT in business operations and ICT readiness by SMEs to enhance their capacity to cope with future crises akin to the COVID-19 pandemic.

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APPENDIX

A: Ethical clearance

UNIVERSITY *of the* WESTERN CAPE

60 YEARS *of hope, action & knowledge*

15 October 2021

Mrs JN Nwachukwu
School of Business and Finance
Faculty of Economic and Management Sciences

HSSREC Reference Number:	HS21/8/12
Project Title:	The role of Information and Communication Technology in selected SMEs' operations in the Covid-19 era in the Western Cape
Approval Period:	**14 October 2021 – 14 October 2024**

I hereby certify that the Humanities and Social Science Research Ethics Committee of the University of the Western Cape approved the methodology, and amendments to the ethics of the above mentioned research project.

Any amendments, extension or other modifications to the protocol must be submitted to the Ethics Committee for approval.

Please remember to submit a progress report by 30 November each year for the duration of the project.

For permission to conduct research using student and/or staff data or to distribute research surveys/questionnaires please apply via:
https://sites.google.com/uwc.ac.za/permissionresearch/home

The permission letter must then be submitted to HSSREC for record keeping purposes.

The Committee must be informed of any serious adverse events and/or termination of the study.

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

Director: Research Development
University of the Western Cape
Private Bag X 17
Bellville 7535
Republic of South Africa
Tel: +27 21 959 4111
Email: research-ethics@uwc.ac.za

NHREC Registration Number: HSSREC-130416-049

B: Interview Guide

Dear Respondent,

My name is Juliet Nwakaego Nwachukwu. I am a master's student (Master of Commerce in Management) from the School of Business and Finance, Economic and Management Sciences Faculty, at the University of the Western Cape. For the completion of my research project, I am inviting you to participate in this study titled: The role of Information and Communication Technology in the operations of selected SMEs in the Covid-19 era in Cape Town, Western Cape.

The research question formulated for this study are:

RQ1: How did SMEs utilize the ICT resources during COVID-19 pandemic in Cape Town?

RQ2: What was the role of ICT in SMEs business operation during the COVID-19 pandemic?

RQ3: What factors influence ICT infrastructure and resources adoption and alignment with changes in the Covid-19 business environment?

Below ethical standards will be adhered to throughout the research process.

a. Your participation in this research is anonymous and voluntary, and the information provided will be kept confidential.

b. You can withdraw from participating at any time without any prejudice

c. All the information gathered will be treated for academic purposes only

d. The study is in line with the rules and regulations that guide the University of the Western Cape, and the researcher will not misuse the position as a researcher for personal gain

e. The research aim is not to harm the respondent or their business

f. Only participants who are 20 years and above are allowed to participate in this study

Please be assured that all information provided in this study will remain confidential

Sign below if you are willing to participate in this interview.

Signature:……

Date:……

Thank you for participating in this research.

Should you have any queries please contact Juliet Nwakaego Nwachukwu, 4008697@myuwc.ac.za

Project Title: **The role of Information and Communication Technology in the operations of selected SMEs during the Covid-19 Era in the Western Cape.**

Semi-structured interview:

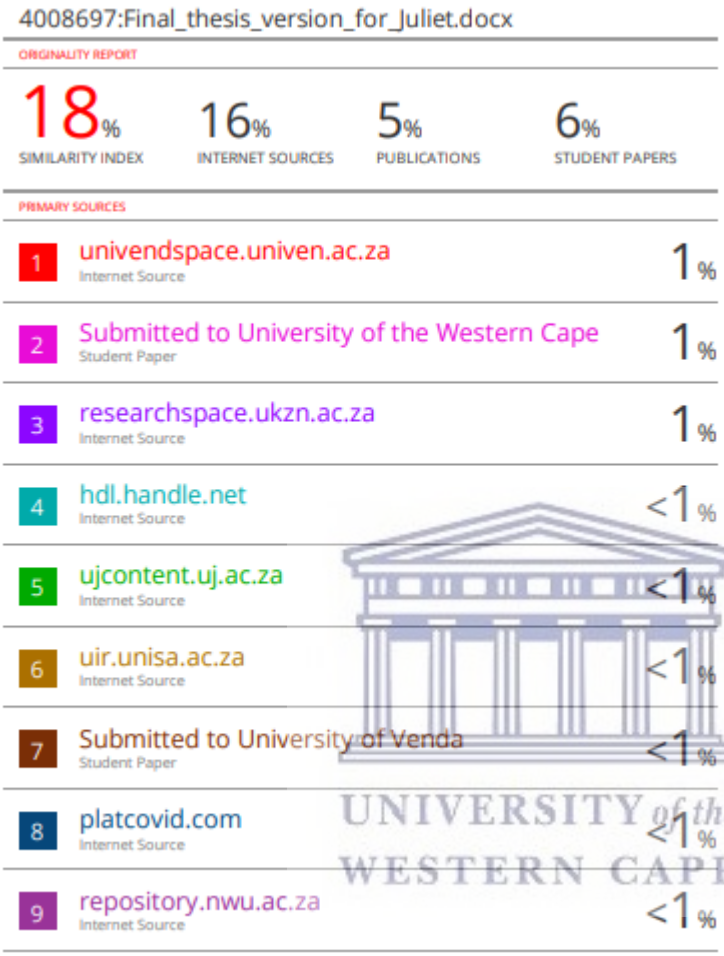
This interview question listed below is a guideline, and it might be rephrased or changed during the cause of the discussion in order to solicit more information. The questions align with the above questions, which assist the researcher in answering the questions.

1. What type of SMEs sector do you operate?
2. How long have you been in business?
3. What are the biggest challenges encountered in business during Covid-19 pandemic?
4. Please list the ICT resources/tools you had in your business before the Covid pandemic in 2020

    a. Which ICT resources/tools did you adopt in your business during the Covid pandemic?
5. Briefly state how ICT is used in your business (specify the business operations)
6. How did you prepare your business for new ICT resources acquired during Covid? (Please specify e.g., training, outsourcing etc.)
7. How did ICT tools help your business operations during the Covid-19 pandemic?
    a. How did your business cope with the transition of changing environment? (Please give examples)
    b. What were the main challenges for you to adapt your business to the Covid pandemic environment?
    c. How have ICT impacted your business operations during the Covid pandemic period (please specify)
8. Which ICT resources/tools have provided the most opportunities for your business during the Covid pandemic?
    a. Which business operations in your organization still require investing in ICT resources/tools? (Please specify)
9. What would you consider your biggest success, in terms of migrating to online platform of your business during the pandemic?

10. In terms of your skills/experience as the owner, what do you consider to be the most valuable when navigating such a turbulent environment with the use of ICT?
11. What are the key factors that may impact the adoption of ICT by SMEs during Covid-19 pandemic and beyond?
12. Do you have any other comments regarding the adoption of ICT in SMEs during the turbulent environment such as the Covid-19 pandemic?

C. Turnitin Report



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