



UNIVERSITY OF KWAZULU-NATAL

The Impact of the Coronavirus on Electronic Commerce among Small and
Medium Enterprises in Gauteng

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College of Law and Management Studies

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DECLARATION

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ABSTRACT

During the Covid-19 pandemic, small and medium-sized enterprises (SMEs) have had to shift business operations to online, due to government restrictions. The urgency to change to a digital model caused many SMEs to be challenged by one or more of the four e-commerce resources to complete an e-commerce transaction, namely usage of reliable broadband, e-shop of products, digital payment, and logistics to the consumer. The literature revealed that SMEs lacked the infrastructure to support the digital transformation into a successful business model and had to close their businesses.

This mixed-methods study addressed this gap by using constructs in the resource-based theory and dynamic capabilities theory. A conceptual model was developed which depicted the relationship between the e-commerce resources and e-commerce growth which was moderated by dynamic capabilities.

Several hypotheses were postulated in the conceptual framework and data was collected from the SME owners in Gauteng Province, South Africa. The simple random sampling technique was used to survey 307 retail SMEs in Edenvale, Gauteng. The survey was distributed via email to the SMEs that were alluded in the study. Descriptive and inferential statistical analysis was used to analyse the data that was collected through the survey, using the Statistical Package for Social Sciences and tested using Structural Equation Modelling. Purposive sampling was used for the qualitative study and the semi-structured interviews were conducted with 13 SME owners, to gain an in-depth understanding of the factors that impacted their e-commerce growth. Thematic analysis, via Microsoft excel, was used to analyse the transcripts by focusing on identifying and arranging the codes and patterns.

The findings revealed that digital payments and logistics were significant predictors of e-commerce growth during the pandemic and dynamic skill capabilities moderated the relationship between digital payments and e-commerce growth. However, the usage of broadband and e-shop features were not significant in predicting the growth of e-commerce.

It was ascertained through the interviews, that there is a favourable impact on the growth of e-commerce among SMEs that invested in unique resources and capabilities, since only

those SMEs that had the resources and capabilities managed to survive during the pandemic.

Keywords: SMEs, e-commerce, e-commerce growth, resource-based theory, dynamic capabilities, theory, Covid-19

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LIST OF ACRONYMS AND ABBREVIATIONS

AVE	average variance extracted
BOPIS	buy online, pick up in store model
CFA	confirmatory factor analysis
CFI	comparative fit index
CR	composite reliability
EFA	exploratory factor analysis
EU	European Union
FA	factor extraction
GDP	gross domestic product
ID	identification
ILO	International Labour Organization
ITU	International Telecommunication Union
MSV	maximum shared variance
OECD	Organisation for Economic Cooperation and Development
PCA	principal component analysis
PCs	personal computers
RBT	resource-based theory
RBV	resource-based view
SEM	structural equation modelling
SEO	search engine optimization
SMEs	small and medium-sized enterprises
SMM	social media marketing
SPSS	Statistical Package for the Social Sciences
SSA	Sub-Saharan Africa
SV	shared variance
UK	United Kingdom
UNCTAD	United Nations Conference on Trade and Development
UNESCO	United Nations Educational, Scientific and Cultural Organization
US	United States

CHAPTER 1:

INTRODUCTION AND OVERVIEW

1.1. Introduction

The coronavirus pandemic resulted in a decline of the global economy and continues to apply exceptional burden on businesses and health (Bressan et al., 2021). Digital connectivity was essential for businesses to survive with the regulations imposed and this caused a resurgence of e-commerce globally and in South Africa (Brem et al., 2021; Reardon et al., 2021). Indicators revealed that e-commerce in South Africa had risen by 66% in 2020 (Business Insider South Africa, 2021). However, compared to global developments, the e-commerce industry in South Africa was still in its infancy, with only a small sector shopping through online channels (Pentz et al., 2020). Furthermore, even though there was a tremendous resurgence of e-commerce due to the fear of contracting the virus and the lockdown regulations, the growth in e-commerce was evident mainly in large enterprises, since there the support structure, budget, and skills were available and accessible (Anakpo & Mishi, 2021; Paramannand, 2021). Although several SMEs realised the importance of e-commerce, they still struggled to adapt and adjust since they were not agile enough to alter their operating models quickly. Furthermore, SMEs also lacked infrastructure and had little or no resilience with the online platforms (Zutshi et al., 2021).

The Covid-19 pandemic significantly increased world-wide e-commerce by 26.7 trillion dollars (UN News, 2021). However, SMEs were excluded from this growth during the pandemic as several problems emerged (Lestari et al., 2021). Many countries changed their laws and started initiatives to quickly address the digital needs caused by the pandemic, but despite their efforts, much work remained before e-commerce could have a secure and long-lasting future among SMEs (United Nations Economic Commission for Europe [UNECE], 2022). Internet connectivity and the significant disparity in digital usage between many countries are just two of the difficulties that have been revealed that existed in some form before the pandemic (Statista, 2023a). The shift to digital technology has been underway for a while, with varying degrees of success in different nations, however, it became urgent to speed up the process and give emphasis to resolving related issues (South African Reserve Bank [SARB], 2021). Due to a lack of the necessary skills and IT savviness, many SMEs globally also encountered difficulties entering the e-commerce industry and utilising its advantages (Mathe, 2020). As privacy and cybercrime peaked during the pandemic, trust in

digital payments became a growing concern and many SMEs also struggled to adapt as logistics were disorganised and unprepared (Arndt et al., 2020). E-commerce could assist SMEs and allow them to reach customers in more regions, but generally SMEs have not completely taken advantage of the commercial prospects that e-commerce offered (Mathe, 2020).

Researchers in Indonesia found that non-adopters of e-commerce caused SMEs to experience a decline in income compared to adopters of e-commerce during the Covid-19 pandemic (Lestari et al., 2021). Over 63% of SMEs in Australia sold their products online in 2021, which was the highest adoption rate for SMEs world-wide. Turkey had the lowest rate of sales online among SMEs, at less than 12% overall. SMEs in Israel and Portugal also lacked in sales digitalisation, and South Africa online sales was incomparably low (Statista, 2023a).

The novel Covid-19 pandemic forced South African businesses to change their operations from face-to-face to online, in order to survive (Eynon, 2021), and many businesses that were not equipped to implement e-commerce in their trading model, shut down (Costa & Castro, 2021; Deshmukh & Thadakamalla, 2021; Johnston, 2021; Khan et al., 2021; Sumarliah et al., 2022; Tokar et al., 2021). According to Redflank (Businesstech, 2021), 26% of SMEs in South Africa had to close provisionally or permanently during the Covid-19 lockdown. Furthermore, 54% of the respondents revealed that they were operating beneath their usual volume, whilst 33% disclosed that they required financial support to resume trading (Businesstech, 2021).

Although e-commerce platforms have become complex, they provide almost every type of solution for online trading (Dragomirov, 2020). Businesses in South Africa were overwhelmed by the changing technology and the sluggish approach by SMEs towards adopting e-commerce (Lestari et al., 2021). Lack of business investment in virtual platforms has also impacted the confidence of consumers negatively, which has certainly had a ripple effect on the economy (Ibn-Mohammed et al., 2021).

1.2. Background

The coronavirus is one of the most severe pandemics that the world has experienced (Rudan, 2020). According to World Meters (2021), globally the coronavirus claimed over five million lives. In order to survive through the pandemic, change was essential in business, hospitals, schools, and most areas of society. To avoid the virus and reduce the infection

rate, people were obliged to use face masks, rinse and disinfect their hands, apply a social distance, and stay at home to lessen interaction in busy malls and public spaces (Rudan, 2020).

SMEs are fundamental participants in a world-wide setting, especially in developing countries like South Africa (Robb et al., 2020). The World Bank estimates that SMEs make up 90% of trades and over 50% of global jobs. South African SMEs epitomise above 98% of businesses and provide employment for approximately 60% of South Africa's workforce throughout all sectors. SMEs in South Africa are also responsible for 25.8% of employment creation in the private sector and contribute 39% to the national gross domestic product (GDP) (Kalidas et al., 2020). Globally, SMEs focus on products that have minimal cost and the least resource requirements (Orzes et al., 2020).

During the Covid-19 pandemic, SMEs had to move their business online, due to lockdown regulations and fear of contracting the deadly virus. SMEs had to buy, sell, and communicate to suppliers and consumers online. However, many traders could not fulfil those requirements and had to close down (Costa & Castro, 2021; Deshmukh & Thadakamalla, 2021; Johnston, 2021; Khan et al., 2021; Sumarliah et al., 2022; Tokar et al., 2021). The Covid-19 pandemic resulted in a GDP decline of around 7 % at the end of year 2020, with over 2.2 million lost jobs and the country was downgraded to junk status. Most industries were negatively affected with construction being the highest at -76.6% (Statistics South Africa [Stats SA], 2020).

As the world navigated through the uncharted territory of the Covid-19 pandemic, the immense pressure of businesses and consumers moving online to buy and sell products, the entire world depended on access to reliable broadband connection as a first step to accomplishing a fulling operating business online (Owusu-Agyei et al., 2020). Thereafter, an e-shop could be created or used, once the consumer has chosen their goods, it is paid for digitally and shipped (Davis-Sramek et al., 2020). Therefore, there are four major resources needed to complete an e-commerce transaction, namely access to reliable broadband, e-shop of products and services, digital payment, and logistics to the consumer (Kitukutha et al., 2021; Raval & Bhatt, 2021). If any of these resources are omitted, an e-commerce transaction is incomplete, directly affecting the growth of e-commerce (Vidya & Prabheesh, 2020). There could be various other resources that are needed for the e-commerce platform, however, these four are the major resources that are needed to conduct an e-commerce

transaction and most of the resources studied are categorised with one of the four major resources (Costa & Castro, 2021; Rudan, 2020; Taranenko et al., 2021). Through research (Mikalef et al., 2021), it was revealed that the usage of e-commerce resources requires capabilities for its use. Dynamic capabilities are represented by the ability to sense, seize and transform a business (Warner & Wager, 2019). Therefore, the characteristics of these capabilities are matched and through various studies (Zimuto, 2018), and was proven that these capabilities support or mediate the relationship between resources and business performance. Therefore, the capabilities that support the four major resources that impact the growth of e-commerce are skills, digital marketing strategies, cybercrime management, and logistics management.

The literature revealed that the sudden need to utilise e-commerce amongst SMEs became a catastrophe (Kitukutha et al., 2021; Raval & Bhatt, 2021; Rudan, 2020), since many SMEs grappled with one or more of the four resources referred to above (Costa & Castro, 2021). For example, although access to broadband has been a challenge for many years, the coronavirus exacerbated the situation (Azevedo et al., 2021; Dow-Fleisner et al., 2022; Vidya & Prabheesh, 2020). As different countries opted for a complete lockdown, the entire world became totally dependent on the internet for survival, communication, and making ends meet (Sun et al., 2020). This total dependency on broadband exposed several challenges and needed immediate attention to arrive at solutions (Wairimu, 2020; Zhang et al., 2020).

Due to consumers also working from home, shopping online became a necessity (Netshirando et al., 2021) and consumers expected a safe, secure, and easy to use platform with a widespread variety of merchandise being available (Pentz et al., 2020). However, safety and security could not be assured by SMEs during the pandemic, as cybercrime was at its peak, and even with great effort, it was inevitable (Kurshan & Shen, 2020; Ma & McKinnon, 2021). Digital marketing strategies on the e-shop platform were not applied by SMEs due to lack of skills and lack of awareness that these tools attract consumers (Kundu, 2021; Tronvoll et al., 2020). Customers also desired a personal experience, the similarity of going into the brick-and-mortar stores, and being able to touch and feel the product (Netshirando et al., 2021). Consumers preferred in-store shopping, as they were able to walk out with the goods. Conversely, throughout the pandemic, unfulfilled order deliveries became a norm, as the demand was too high for logistics to manage (Kushwaha, 2021; Montoya-Torres et al., 2021; Orji & Okwu, 2021).

From a review of the literature, it became apparent that very limited academic research has been published on the growth of e-commerce among SMEs in South Africa, especially during the coronavirus pandemic. The pandemic was a new phenomenon and most of the information published on e-commerce during the pandemic was through magazine articles and industry reports. Therefore, the need for an in-depth academic investigation of the growth of e-commerce among SMEs in South Africa, became apparent and highly necessary.

This study critically analysed the challenges SME owner-managers faced with e-commerce, during the pandemic. The South African economy collapsed when SMEs could not survive through the long, and painful pandemic (Mkansi, 2021; Mothobi & Grzybowski, 2017; Netshirando et al., 2021). There was also a lack of skills to use e-commerce technologies efficiently (Chigbu & Nekhwevha, 2021), and this together with cybercrime and unfulfilled deliveries, motivated the researcher to undertake this study to develop strategies for SMEs to continue operating during disruptions, such as the Covid-19 pandemic.

It is against the above background that this study assessed how the four major e-commerce resources impacted the growth of e-commerce among SMEs through the Covid-19 pandemic. As previously mentioned, the four e-commerce resources are broadband usage, features of the e-shop, digital payments, and the logistics. Researchers such as Mohamed et al. (2018), revealed the resources needed for the front-end integration of an e-business was the e-shop, digital payments and logistic services, however, broadband connectivity was not included. Through the pandemic, the internet was a resource that was extremely valuable to businesses (Van Deursen et al., 2021; Zhang et al., 2020), yet most businesses grappled with the internet connectivity throughout the pandemic, which caused loss of sales (Owusu-Agyei et al., 2020; Tsang et al., 2021). Therefore, the researcher added broadband to the four major resources, as Covid-19 made it clear that internet for businesses were a major concern (Berners-Lee, 2020).

Dynamic capabilities possessed transforming attributes (Rashid & Ratten, 2021), through various literature (Odwaro et al., 2022; Rashid & Ratten, 2021; Robb et al., 2020), during the pandemic, those business that succeeded with the usage of the four e-commerce resources was supported by a major back-end stanchion, which were the representatives of dynamic capabilities in this study. The dynamic capabilities in this study integrated the role of knowledge management and learning (Easterby-Smith & Prieto, 2008), therefore included skills, digital marketing strategies, cybercrime management, and logistics management,

which are purported to moderate the relationships between the four e-commerce resources and the growth of e-commerce. These representatives are discussed in great detail in Chapter 3.

1.3. Rationale of the study

The inveterate fatal novel coronavirus compelled consumers to make purchases online, due to the lockdown regulations, more specifically, the need to have less contact with surfaces and people, and be less exposed to areas where there is high foot traffic, such as malls and supermarkets (Sheffi, 2020). In order to cater for the sudden surge in the need for online shopping, businesses had to adapt their operations, business model, product range, etc. and also invest in either creating or improving their online presence to remain in business (Noyal et al., 2022).

Although e-commerce platforms are continuously evolving, fuelled by the current pandemic which South Africa has been facing, e-commerce is far from being exhausted as a research topic (Albaz et al., 2020; Lestari et al., 2021). The need began to accelerate rapidly when businesses and consumers shifted to online platforms and South African SMEs were not fully ready to meet the fast-tracked requirement for digitisation. The increased consumer demand has also placed overwhelming pressure on businesses to deal with the associated challenges (Verma & Gustafsson, 2020).

The practical implication of this research relates to ascertaining how to assist SMEs to smartly digitise their business model and utilise e-commerce more effectively and efficiently in their operations. An in-depth investigation into, and understanding of the challenges experienced with the usage of e-commerce among SMEs, was necessary, so as to develop strategies to better manage them since they (SMEs) are the bedrock of a country's economy (Abdelrhim & Elsayed, 2020; Andriani et al., 2020).

This study may also assist SMEs to make more informed decisions when using e-commerce platforms, thus contributing to improving the effectiveness of the new way of trading. The findings may also contribute to preparing South African SMEs to adapt more easily, should a similar disruption occur in the future.

Buying and selling products via digital platforms have become the new way of conducting business and e-commerce platforms and technology are continually evolving (Albaz et al., 2020; Statista, 2023a). To compete and gain a competitive advantage, this study will provide

greater insight into how SMEs could adapt and adjust strategies to capitalise on business opportunities through e-commerce.

1.4. Brief literature review

1.4.1. The e-commerce process

The e-commerce process is the method of selling or buying goods, products, or services on an e-shop platform, through the internet. The e-commerce process starts with accessing reliable broadband in order to create an e-shop platform with products and services (Tofan & Bostan, 2022; Szyjewski, 2019). Businesses use digital payments for consumers to pay for the product and the goods are transported to the customer. The four e-commerce resources and the dynamic capabilities are discussed next.

1.4.2. Broadband

A person has to have reliable access to the internet to do business or shop online (Kim et al., 2011). A direct impact on the penetration of internet usage and e-commerce sales is the cost of data to go online (Li, 2020, Karine, 2021; Gachenge, 2020; Mofokeng, 2021). In a developing country like South Africa, the price of broadband is nearly double that of other countries (Durodolu & Mojapelo, 2020).

To curb the spread of the coronavirus in 2020, government officials globally completely locked down different countries, one by one (Mofijur et al., 2021). Business meetings, payments, promotions, and sales moved online, and internet connectivity and speed were of absolute importance to achieve efficiency and effectiveness (Mattera & Gava, 2021). When connectivity slowed down, inevitably it directly impacted the work-pace (Mattera & Gava, 2021). Time lost on the poor broadband connection had an enormous influence on growth and efficiencies (Owusu-Agyei et al., 2020). Furthermore, since productivity is fundamental to any successful business, it is therefore vital for employees to perform at their best by relying on a strong internet connection (Obrenovic et al., 2020). SMEs assumed that it was not profitable to pay more for a fast fibre connection (Wairimu, 2020), since they believed that this was a temporary disruption.

Since SMEs needed an excellent digital infrastructure to benefit from e-commerce, some switched to cloud solutions to expand innovation and provide efficient results (Fitriasari, 2020; Guo et al., 2020; Klein & Todesco, 2021). Nonetheless, cloud computing consumes a large amount of data, and for SMEs to exploit the cloud at an adequate performance, internet

speeds have to be strong for uploads and other online tools that businesses use (Mansouri et al., 2020).

Internal communication was essential for SMEs to operate smoothly and through the pandemic, many businesses suffered losses due to the weak internet connection (Hu & Kee, 2022). Emails, intranet, e-newsletters, and webinars could not be used to maximum benefit and keeping staff updated with company and product information became a challenge (Toniolo-Barrios & Pitt, 2021).

External communication with customers and suppliers was also of ultimate importance (Klein & Todesco, 2021), and obtaining a strong online interaction platform with suppliers and customers was highly essential for SMEs to achieve sustainability in e-commerce during the pandemic (Klein & Todesco, 2021). However, consumers didn't receive a quick response in this digital age because businesses failed to meet consumer requirements through the pandemic, which resulted in markets being lost (Toniolo-Barrios & Pitt, 2021).

During the lockdown, this latency and buffering became challenges as video conferencing and meetings were distorted, which left many employees frustrated and this impacted the workforce morale (Aburukba et al., 2020). This also impacted consumers trying to download a video of products and services that they desired to purchase, which greatly obstructed the growth of e-commerce for SMEs (Zhang et al., 2020).

South African businesses have taken a lackadaisical approach to e-commerce when prioritising profits and being innovative (Singh, Gupta et al., 2021). Before the Covid-19 pandemic, South African SMEs did not invest much in gaining an online presence and considered e-commerce as a separate business, rather than embracing the omnichannel which is the future model of business (Scopelliti, 2018). In reality, over a year after Covid-19 began, South African SMEs began to adopt e-commerce in their operations, and the consequences of these delayed decisions left the country far behind the rest of the world (Schwab & Malleret, 2020).

1.4.2.1. Skills

Broadband accessibility requires skills (Eynon, 2021). Businesses with staff that have no skill, find it difficult to use the internet (Eynon, 2021). Covid-19 forced SME owner-managers to learn how to manage their staff from a virtual environment without social capital (Bressan et al., 2021, Chapman, 2021). As many SMEs returned to the place of work, new skills requirement emerged to transition employees digitally (Agrawal et al., 2020).

Covid-19 also brought a new landscape of learning through live conferencing. This transformation has made it possible for SME owner-managers to train their staff in a more cost-effective way, reaching a larger scale of employees at the same time; however, only a small portion of SMEs, which had funds and infrastructure, took advantage of this through the pandemic (Wendt et al., 2021). Different SME sectors required a different set of skills and training (Wendt et al., 2021). Additionally, banks had to upskill their staff in compassion because there were distraught customers that needed help to use online facilities, during Covid-19 (Agrawal et al., 2020; Anderson et al., 2021). The Covid-19 pandemic changed the employment landscape totally and this requires large-scale reskilling or upskilling of workers on digital platforms (Agrawal et al., 2020; Anderson et al., 2021; Choudhary & Chintaluri, 2021; Wendt et al., 2021).

1.4.3. E-shop platforms

SMEs have not invested sufficiently in their online strategy (Xu et al., 2020; Raval & Bhatt, 2021; Pentz et al., 2020). For instance, research reveals that e-shoppers are attracted to the graphic qualities of the online shop (Li et al., 2021) and the superiority of the pictures of products offered could sometimes determine the success of an online shop (Pentz et al., 2020). Furthermore, through the pandemic and the enforced lockdown regulations, online consumers preferred to scrutinise the product or service, as they would do at the mall. Thus, it was crucial for e-commerce businesses to have compelling pictures and videos to persuade consumers to purchase so as to increase sales (Wei & Zhang, 2021). Moreover, having an online shop that is mobile friendly is of utmost importance, predominantly during a pandemic (Kassim et al., 2021). Although many South Africans do not have access to fibre lines, most have access to data on their phones and they access the internet through their mobile on a daily basis (Akash, 2020). Creating mobile-friendly channels for consumers to obtain information about promotions and new products could assist online businesses to increase sales (Akash, 2020). Through the Covid-19 lockdown, consumers expected 24-hour availability to respond to any concerns or questions they had about the product (Pentz et al., 2020; Mofokeng, 2021). However, many SMEs in South Africa had not invested sufficiently in their online shops to make for a seamless shopping experience.

Simple and well-defined product description was difficult to obtain during the pandemic since many SMEs had newly created their online presence, which hampered the search engine and consumers were left aggrieved (Kundu, 2021; Mofokeng, 2021). SMEs that created an online presence during the Covid-19 pandemic, also struggled with the

transparency of the products on their website (Husain et al., 2020). According to Accenture (2018), South African corporations lost R663 billion in sales, which consists of 33.3% shifting to other brands and 66% being due to deficiency of relevance. However, in 2020, consumers were forced to shop online (Pentz et al., 2020; Mofokeng, 2021), which exposed all the flaws businesses had with conducting business via e-commerce, which resulted in frustrated, unhappy, and dissatisfied consumers (Pentz et al., 2020; Raval & Bhatt, 2021; Mofokeng, 2021).

1.4.3.1. Digital marketing strategies to support the e-shop platform

Globally, businesses are shifting towards digitisation of operations, and owners-managers of SMEs are slowly realising the demand for digital marketing to positively adapt and vigorously compete in the new normal. However, digital marketing is an unfamiliar terrain for many SMEs, especially in South Africa (Bimha & Primrose, 2021). Digital marketing is consistently changing with technology and SMEs find it hard to stay abreast (Thaha et al., 2021). Digital marketing strategies can be expedited using different channels, some of which include search engine marketing, web analytics, social media marketing (SMM), digital advertising, email marketing, search engine optimisation (SEO), and content creation (Thaha et al., 2021).

1.4.4. Digital payment

Digital payment systems are primarily important to seal the deal in an online shopping journey (Ferguson et al., 2019). Covid-19 created a desperate need for digital payments and amplified the demand for SMEs to invest in a smooth-running payment gateway (Kumar, 2020). However, bank fees were a major consideration and a barrier to e-commerce, because, for SMEs, 5% of the sale was the bank fees (Tambe, 2020). Furthermore, businesses that concluded deals with global consumers encountered much higher banking fees (Klein, 2020). For example, if a business utilised PayPal, it would have suffered a loss due to the foreign exchange and additional charges levied (Mkansi, 2021). According to Mkansi (2021), the increased banking fees had adverse effects on the growth and development of minor online merchants. The transactional banking segment of e-commerce also encountered enhanced challenges during the pandemic with the creativity of payment portals to cater to those consumers that cannot obtain credit cards, the safety of data, and cybercrime (Akanfe et al., 2020; Najib & Fahma, 2020).

With the increasing evolution in e-commerce globally, one of the main concerns is the cumulative number of online security violations (Akanfe et al., 2020). According to Vuyo Mpako, the Head of e-commerce at Standard Bank, lack of reliance on virtual portals and a belief that a credit card is needed to buy online, is holding back many consumers. Vuyo argues that the journey of purchasing online is non-direct as numerous consumers browse online but prefer to conclude the deal offline. According to an Accenture survey in 2020, 69% of customers were unsatisfied with not being able to access enough info to purchase and an inadequate number of options for payment was a source of frustration (Andrianto et al., 2021). Gora (2020) argues that SMEs showed no interest in trying to change this.

In the US, some consumers are in possession of up to six credit cards (Zhao et al., 2021). However, South Africans have less than two credit cards per household, as many South Africans don't qualify for credit cards (Pentz et al., 2020). Furthermore, in South Africa, many payment methods were created, but some did not last since they were deemed to be unreliable (Priyono et al., 2020; Pentz et al., 2020).

In the past, payment was simply a means to an end of a sale, however, it now presents a chance to interact with consumers and improve their overall experience when shopping online (Gora, 2020) and differentiate from competition (Zuyeva et al., 2020). The challenge with providing that kind of service was exacerbated by the need to cater for a wide variety of markets and payment methods while still remaining economically viable (Gora, 2020).

1.4.4.1. Cybercrime management

Payment portal companies are continually developing tools for recognising fraud; however, through the Covid-19 pandemic, digital payments became the most common way to pay for goods, and cybercrime took to a whole new level, impacting businesses and consumers (Wewege et al., 2020; Pentz et al., 2020; Mofokeng, 2021). Criminals upgraded their skills parallel to the innovative approaches designed to mitigate fraud (Kurshan & Shen, 2020). During Covid-19, this problem was exacerbated due to the large number of new consumers using e-commerce, and therefore, it became more difficult to identify suspicious transactions (Ma & McKinnon, 2021).

1.4.5. Logistics

In the midst of the global pandemic, the value chain of many businesses was immensely disrupted by lockdown regulations (Butt, 2021; Rukasha et al., 2021). Many businesses ended operations, and this had a direct impact on the delivery of products. Logistics

companies and logistics departments were highly pressurised and overwhelmed with the workload as all consumers were forced to shop online (Sudan & Taggar, 2021).

Furthermore, numerous logistics firms in South Africa have been astonishingly sluggish at adopting digital solutions (Chaterera-Zambuko et al., 2023). Digital tracking methods together with manual systems are inefficient (Sudan & Taggar, 2021; Chaterera-Zambuko et al., 2023) and although there are current trials to unify and refine data flow to streamline processes, it is still an issue that needs to be resolved (Attaran, 2020; Chaterera-Zambuko et al., 2023).

The erratic price of fuel during Covid-19 contributed to higher transportation costs, which impacted delivery costs for SMEs, and caused fluctuating prices of products and services, and directly obstructed the confidence of consumers to buy online (Majavu, 2021). Reverse logistics also created unforeseen losses through the pandemic, as e-commerce activity increased. Due to the lockdown regulations, consumers returned goods they were not happy with, and some being damaged in transit (Kushwaha, 2021). Reverse logistics also hindered SMEs that had limited budgets and could not afford to return products (Mathu, 2021; Orji & Okwu, 2021).

1.4.5.1. Logistics management

The Covid-19 pandemic revealed that several SMEs were vulnerable as they adopted a ‘single-source’ strategy in logistics (Mangano et al., 2022; Ferreira et al., 2021; Montoya-Torres et al., 2021; Ali et al., 2021). This ‘single-source’ strategy worked perfectly during a normal period but instantly raised problems when the chain was disrupted (Aldrighetti et al., 2021; Mangano et al., 2022; Ferreira et al., 2021; Montoya-Torres et al., 2021; Ali et al., 2021). Logistics firms were unable to fulfil all orders timeously during the Covid-19 pandemic as the demand was too high (Mangano et al., 2022; Ferreira et al., 2021; Montoya-Torres et al., 2021; Ali et al., 2021).

1.5. The impact of Covid-19 on e-commerce

Globally, the novel coronavirus created a unique situation that prompted rapid digitisation across all facets of business and for many people, online shopping became the new normal (Verachia, 2020). It is assumed that when an economic downturn arises, consumers’ desire for luxury products decreases, as buyers concentrate on fulfilling their fundamental needs such as health, wellness, and safety, which aligns with Maslow’s hierarchy of needs (Rukuni & Maziriri, 2020). People who had never interacted online before, such as senior citizens,

had no choice during the lockdown but to become techno-literate in order to obtain essential goods daily (Sharma & Subramanyam, 2020). However, the accelerated pace of using e-commerce in South Africa highlighted its advantages as well as the associated hurdles. The lockdown restrictions by the South African government had a disastrous effect on SMEs and their e-shops (Donthu & Gustafsson, 2020). Work, communication, education, and entertainment moved to online platforms (Dwivedi et al., 2020), which brought numerous businesses to a halt and even resulted in shutdowns.

Various industries experienced varying degrees of sales, and employment instability as a result of the pandemic and associated government restrictions on the labour markets, economic relations, and businesses, which include international supply chains (Lenzen et al., 2020). The challenging setbacks from the pandemic and social distancing policies impacted businesses in the tourism industry, accommodation and logistics (Teo, 2020). Numerous South African SMEs were unsure how to adapt to the new way of doing business by digitising their operations fast enough and utilising e-commerce. The Covid-19 pandemic impacted the entire supply chain of businesses that caused a decrease in production and delivery of services (Alzoubi et al., 2022). Unemployment rates increased, the economy deteriorated, and the future economic outlook appeared negative (Ceylan et al., 2020).

Although globally the coronavirus caused devastation to the economies, developed countries found it easy to improve their economic status as they had a good infrastructure. Developed countries and large companies adopted e-commerce in their daily trade (Zahra, 2021). Even though e-commerce sales have risen drastically, these numbers are amongst the large businesses with advanced infrastructure. South Africa has struggled through this pandemic and is continuing to adjust to this ever-changing, fast-moving technology (Dwivedi et al., 2020; Iyamu, 2020; Paramannand, 2021).

South Africa's online retail industry accounted for 1.4% in total retail during 2020 (Statista, 2023a), with the US and China close to 20% in the same year. The GDP decline in the first quarter caused a 30.1% decline in the unemployment rate in the first quarter of 2020 (Statista, 2023a). E-commerce was crucial for businesses to prosper and boost retail sales, as well as health protection from Covid-19. The pandemic highlighted the urgent need for governments to narrow the digital divide (Arndt et al., 2020). Conventionally, opening a physical store is accompanied with large capital investments, however, starting a retail business online requires lower risk and minimal capital. Therefore, creating an opportunity for SME retailers

to realise the importance of e-commerce towards the South African economy, allowing them to compete with larger companies, by increasing competition, innovation and general regular living standards for South African citizens (Insaka, 2023).

1.6. Problem statement

The coronavirus pandemic highlighted the significance of investigating the challenges experienced with e-commerce among SMEs in South Africa (Tregua et al., 2021; Yi, 2020). The problem occurred when the movement of people was restricted and people became anxious about social distancing, which accelerated the use of online shopping (Kitukutha et al., 2021).

According to many researchers, inter alia, Albaz et al. (2020) and Agrawal et al. (2020), the ideal situation for SMEs using e-commerce platforms to sell their products during the pandemic, would be to have capable internet connectivity to operate under pressure in an efficient manner. Ferreira et al. (2021) emphasized that in order for SMEs to thrive during and post pandemic, would include being able to streamline the entire e-commerce process from end to end. Kalidas et al. (2020) highlighted that, to succeed with e-commerce during the pandemic involved uploading high resolution quality pictures on business websites without having huge delays, conducting online meetings without buffering, receiving and sending out payments without delays. Inclusive of the above-mentioned support, a robust, user friendly and attractive e-shop, a trustworthy payment portal and on time delivery at reasonable costs, would have assisted with an increase in e-commerce sales (Agrawal et al., 2020; Mkansi, 2021).

The reality was catastrophic, as SMEs in South Africa were totally unprepared for a digital world and did not transform their business fast enough, causing many SMEs to close (Mofokeng, 2021). South African SMEs lacked the necessary resources and capabilities for operating a business completely online, especially during a complete lockdown (Anakpo et al., 2021). Evidence from research conducted by the Small Business Institute (SBI), revealed that SME owners were incapacitated with the impact from lockdown regulations and were unable to pay staff, bills or even survive (SBI, 2020). Due to lack of skills and experience in a digitised business, the reality was abysmal internet connectivity, poor website quality, unsafe payment portals and never on time delivery (Arndt et al., 2020). The literature reviewed has provided basic insights into some of the problems and challenges associated with e-commerce amongst SMEs (Diaw, 2020; Ebner, 2018; Gusarova et al., 2021;

Hamraoui, 2020; Kitukutha et al., 2021; Kretzschmar, 2021; Lambrechts & Sinha, 2019). However, the solutions provided no longer embrace the intricacy of the problem, as the challenges experienced with e-commerce became significantly amplified through the pandemic, and the reality was far from the ideal situation (Oktora et al., 2020; Sumarliah et al., 2022; Abdelrhim & Elsayed, 2020; Pantelimon et al., 2020; Gokila, 2021; Johnston, 2021). The consequences of gap between the ideal situation and the reality, resulted in a drastic downturn on the global and national GDP (Statista, 2023a; Arndt et al., 2020). Therefore, there is a gap in the knowledge resulting from the sudden resurgence of e-commerce due to the Covid-19 pandemic. The coronavirus pandemic resulted in a surge in digitisation, and technology should have been fully capitalised on to support businesses to remain operational. Developing survival strategies by utilising digital platforms was essential for recovery of the South African economy (Mofokeng, 2021). Thus, the researcher examined the impact of four major resources on the growth of e-commerce, and the moderating effect of dynamic capabilities on the relationship between the resources and growth of e-commerce, among SMEs in South Africa. Should South Africa encounter a major disruption in the future, this study aims to contribute to knowledge which will assist South African SMEs to be better prepared to handle the challenges and remain in business.

1.7. Research aim and objectives

The aim of this research was to assess how the resurgence of e-commerce in South Africa during the Covid-19 pandemic impacted SMEs using e-commerce resources, and to devise strategies to assist the SMEs to become more agile, resilient, and better able to cope with disruptions.

To address the aim, the following objectives were formulated:

1. To critically analyse the impact of broadband usage on the growth of e-commerce among SMEs during the Covid-19 pandemic.
2. To assess the impact of e-shop features on the growth of e-commerce among SMEs during the Covid-19 pandemic.
3. To evaluate the impact of digital payment systems on the growth of e-commerce among SMEs during the pandemic.
4. To critically review the impact of efficient logistics on the growth of e-commerce among SMEs during the Covid-19 pandemic.

5. To evaluate how dynamic capabilities moderate the relationship between the e-commerce resources and the growth of e-commerce.

1.8. Research questions

1. What impact does broadband usage have on the growth of e-commerce among SMEs during the pandemic?
2. What impact do e-shop features have on the growth of e-commerce among SMEs during the pandemic?
3. What impact do digital payment systems have on the growth of e-commerce among SMEs during the pandemic?
4. What impact does efficient logistics have on the growth of e-commerce among SMEs during the pandemic?
5. Do dynamic capabilities moderate the relationship between e-commerce resources and the growth of e-commerce?

1.9. Research hypotheses

Developing the hypotheses for this research was an outcome of the literature review associated with the aims and objectives. The undermentioned hypotheses were postulated for this research:

H1: Broadband usage positively influenced the growth of e-commerce among SMEs during the Covid-19 pandemic.

H2: Skills set moderated the relationship between broadband and the growth of e-commerce during the Covid-19 pandemic.

H3: Features of the e-shop platform positively impacted the growth of e-commerce among SMEs during the Covid-19 pandemic.

H4: Digital marketing strategies moderated the relationship between the e-shop platform and the growth of e-commerce among SMEs during the Covid-19 pandemic.

H5: Digital payment systems influenced the growth of e-commerce among SMEs during the Covid-19 pandemic.

H6: Cybercrime management moderated the relationship between digital payments and the growth of e-commerce among SMEs during the pandemic.

H7: Efficient logistics services positively impacted the growth of e-commerce among SMEs during the pandemic.

H8: Logistics management moderated the relationship between logistics services and the growth of e-commerce among SMEs during the pandemic.

1.10. Conceptual framework

According to the theory, there are four e-commerce resources needed to successfully complete an e-commerce purchase and if any one of the above elements is missing, an e-commerce purchase is incomplete, and this will affect the growth of e-commerce among SMEs. There are dynamic capabilities that support the independent variables, or four elements as shown below, which are referred to as the moderator variables. Moderator variables are variables that influences or diminishes the relationship between the independent and dependent variables (Memon et al., 2019). Even though e-commerce is generally growing rapidly, the reason for its slow growth among SMEs is due to poor e-commerce platforms, and digital inefficient SME businesses (Oktora et al., 2020). Several researchers, inter-alia, Vidya and Prabheesh (2020), Paramannand (2021), have postulated that during Covid-19 the SMEs struggled with each element in different ways. Therefore, the researcher adopted a holistic approach to this study by taking into account the four e-commerce resources that are postulated to impact the growth of e-commerce.

1.11. Theoretical framework

The growth of e-commerce is directly proportional to its usage (Haryanti & Subriadi, 2020). The strength of the use of e-commerce depends on human acceptance of all or most of its contributing factors (Haryanti & Subriadi, 2020). However, the Covid-19 pandemic compelled the young and old to utilise e-commerce to survive, and gave no option for human acceptance.

This research considered the resource-based theory (RBT) and dynamic capabilities theory. According to Penrose (2019), the theory of the growth of the firm is largely linked to the RBT and the association between business resources and growth was investigated. It was revealed that businesses posited as a framework that entailed a group of resources and concluded that the growth of a business was limited by that fundamental facet of a firm. The RBT incorporated the antecedents of dynamic capabilities theory. Dynamic capabilities are varied between businesses; however, their results are similar across businesses (Warner & Wäger, 2019). The dynamic capabilities were identified in this study as the moderating

variables provided. The dynamic capability is generally the ability of a firm or business to incorporate and construct the external and internal resources and competences to shape the rapidly changing business environments (Mikalef et al., 2021).

1.12. Brief research methodology

1.12.1. Research philosophy

The research philosophy chosen for this study was the pragmatism paradigm which contains a multitude of techniques (Peirce, 2020; James & Dewey, 2005) and embraces an individual's engagements with original historical experiences and deals with research realistically (James & Dewey, 2005). The primary data collection methods that were used are quantitative and qualitative, which involved an online questionnaire with closed-ended questions and face-to-face interviews.

1.12.2. Research design

A mixed-methods design was used since that made it possible to obtain diverse yet complementary information to comprehend the research problem in the best way (Creswell et al., 2003). Quantitative is measurable information, which is articulated through numbers and figures, and analysed through statistical methods (Creswell & Creswell, 2005), whereas qualitative is enunciated via words, sentences, and narratives, and analysed through themes (Creswell & Creswell, 2005). The resurgence of e-commerce in South Africa due to the Covid-19 pandemic has presented many challenges for SMEs in South Africa. The mixed-methods design could provide a rich perspective on the problem as it concerns the growth of e-commerce amongst SMEs in Edenvale, South Africa.

The quantitative method was used to validate the relationships between the growth of e-commerce and the four e-commerce resources, from an SME business perspective. The closed-ended questionnaire was used to provide the option of predefined responses.

The qualitative semi-structured interviews were important in order to attain an extensive and thorough understanding of the challenges that the SME business owner-managers faced, in relation to the four e-commerce resources and their opinion on what other factors affected the growth of e-commerce.

The convergent mixed-methods strategy was chosen since quantitative and qualitative data was collected at the same time and analysed so as to develop greater and more effective knowledge of the resurgence of e-commerce due to the pandemic (Creswell, 2011; Headley

& Plano Clark, 2020). This strategy allowed the researcher to include diverse SMEs from Gauteng in the survey, together with face-to-face interviews, and compare the results to yield authenticated conclusions.

The quantitative research design entailed using the experimental strategy. Experimental design investigates the effect of the independent variable on the dependent variable (Kothari, 2017).

According to Leedy and Ormrod (2005), when a scholar aims to explain a phenomenon, the phenomenological research strategy is suitable for a qualitative research design. Thus, the qualitative research design used the phenomenological research strategy as the researcher investigated the Covid-19 phenomenon and the experiences and challenges faced by the SME owner-managers who either diversified their marketing strategy to e-commerce or did not do so because of the challenges.

The questions were centred around four e-commerce resources of their business, which included aspects of broadband that impact the growth of e-commerce, features of the e-shop platform, digital payments, and logistics.

1.13.Sampling

1.13.1. Target population

The entire population of the SMEs in Edenvale, Gauteng comprises 4900 SMEs. However, the target population for this study was 307 SMEs which are in the retail industry and had an online presence during the pandemic.

1.13.2. Sample size

The target population of the SMEs in Edenvale, South Africa in the retail sector that had an online presence was 307. The sample size for the survey, which is calculated from a population size of 307, using a confidence level of 95%, the margin of error at 5%, response distribution of 50%, was 171 participants that was needed to participate.

The sample used for the qualitative study is 13 business owners that trade in the Gauteng area and had an e-shop platform during the Covid-19 pandemic.

1.13.3. Sampling technique

When a researcher selects a portion of people with certain criteria pertaining to the focus area, from a large population, this is defined as a sample (Creswell, 2013). A sample is used

because it is costly and time-consuming to research the whole population. There are two types of sampling, namely probability and non-probability sampling (Creswell, 2013). This study used non-probability sampling for the qualitative approach and probability sampling for the quantitative approach.

Simple random sampling was used for the quantitative method (Headley & Plano Clark, 2020), since in simple random sampling the entire population is considered in its frame and it provides an equal chance for members to be selected. This sampling technique allowed the researcher to email all 307 business owners in the retail sector that had an online presence to answer the questionnaire. The email addresses were obtained from the Gauteng business directory, which is an online directory available to public. A total number of 202 participants answered the questionnaire, which exceeded the sample size of 171 participants.

Purposive sampling was also used for the qualitative face-to-face interviews. This sampling technique takes into account the purpose of the research and considers only the people relevant to the study (Creswell, 2013). The researcher takes into account variables that were used in conducting a business online during the pandemic and businesses that did not conduct business online would not have used the four resources and its capabilities. The researcher found a gap in the usage of these resources and capabilities, therefore, only businesses that used it was invited to participate in the interview. The researcher conducted face-to-face interviews with 13 business owners from Gauteng, who own or manage an SME and have diversified to e-commerce during the pandemic.

The recruitment of participants for the qualitative face-to-face interviews was done via messages and telephonic conversations. The research study was explained to the potential participants, detailing the reason for the study, and providing reasons for their participation.

1.14.Data collection

Leedy and Ormrod (2015) define a participant as the person or entity that contributes to the interview or questionnaire. The type of questions, validity, and reliability of the questions asked need to be grounded on accomplishing the study objectives and research questions. When a researcher collects data for the first time, it is known as primary data collection. Secondary data is information that has already been gathered from other sources and is available through statistical agencies (Kothari, 2004).

Primary data collection was chosen in this research study using the quantitative and qualitative techniques. The data collection method chosen for this research was primary data

collection using quantitative and qualitative techniques. An online questionnaire containing closed-ended questions were emailed to the business owners/managers, where they could click on the link, and give consent to answer the online questionnaire.

The quantitative online survey was developed via Google forms. The questionnaire contained closed-ended questions, which incorporated the Likert scale and demographic questions. The online questionnaire was also mobile-friendly so business owners could respond fast and effectively.

Structured face-to-face interviews took place with 13 SME owner-managers and aimed to gain a comprehensive understanding of their experiences with e-commerce during the pandemic. The business owner-managers who participated in the interviews, represented the retail industry, which included manufacturing and distribution. Only SMEs located in Gauteng were included in the qualitative interviews due to the accessibility of respondents.

1.15.Data quality

1.15.1. Reliability

Cronbach (1946) defined reliability in research as obtaining the same response from participants using an instrument repeatedly. Reliability is achieved when the researcher achieves consistent results through the research method (Bougie & Sekaran, 2019). In order to guarantee the precision of the quantitative study's research instrument, the researcher conducted a pilot test with a group of participants and determined the Cronbach alpha reliability coefficient. The Cronbach coefficient calculation shows how the factors in the dataset are related, and the closer the coefficient is to one, the better the reliability (Bougie & Sekaran, 2019).

1.15.2. Validity

In research, validity verifies the accuracy of the tools used for data collection (Cronbach, 1946). There are several types of validity, which are briefly discussed next.

(i) Criterion validity

Criterion validity assesses whether the dataset collected produced the intended result (Bougie & Sekaran, 2019). The sample size in this study was determined using a 95% confidence level. Criterion validity also investigates whether the proper tools were used to assess the data collected and validate the hypotheses proposed in the research study (Bougie & Sekaran, 2019). The researcher also employed criterion validity to

ensure that the inferential and descriptive analyses were carried out correctly (Bougie & Sekaran, 2019).

(ii) Construct validity

The construct validity of a dataset is determined by the tools used to measure it (Bougie & Sekaran, 2019). This establishes the research methodology's complete validity. As a result, to guarantee construct validity, the online questionnaire was created by linking the literature related to the research study and the questions (Bougie & Sekaran, 2019). The questionnaire focused on four elements that have a direct impact on e-commerce growth and only included SME business owners/managers as participants.

(iii) Content validity

The questionnaire's content validity assesses whether all relevant parts are included to achieve its construct (Bougie & Sekaran, 2019). Normally, a pilot study is used to ensure content validity. According to Bujang et al. (2018), the minimum sample size for a pilot study is 20, so the researcher confirmed content validity for this study by conducting a pilot test with 20 SME owners.

(iv) External validity

External validity assesses the research findings and how they can be applied and generalised to the real world (Green & Glasgow, 2006). The moderator variables in this study aided in the determination of external validity by assessing the limitations of when the relationship between the independent and dependent variables was strongest.

1.16. Credibility and trustworthiness

The 13 business owner-managers chosen to contribute to the face-to-face interviews were credible and trustworthy as they met the criteria required. These participants were selected from the sample used for the online questionnaire (Gauteng Business Directory, 2023), their businesses had to be in the retail industry, have had access to the internet during the pandemic, and the SME had to have an online business presence during the pandemic. The justification for this inclusion criteria was that this study critically analysed the e-commerce process resources, which included broadband connectivity to access the e-shop platform, digital payments to purchase the goods and finally the logistics to the consumer. Other types of industries could not participate as they would have been deemed to be irrelevant in this

study, due to the fact that their business could not fully use the entire e-commerce process discussed.

The researcher made certain that the process was clearly recorded and documented, to achieve dependability. The researcher derived all interpretations, conclusions, and findings from the data collected.

1.17.Data analysis

Data analysis is a procedure where a great amount of data is reduced to small portions to analyse and interpret more easily (Schensul & LeCompte, 2012). According to Clark et al. (2008), in a mixed-methods study, the data analysis stage involves the quantitative analysis of numerical data by utilising the quantitative technique and the analysis of qualitative data of textual data by utilising the qualitative approach (p.128). There are different types and ways to analyse data.

For the quantitative data analysis, the researcher must first prepare the data (Creswell, 2013). For the quantitative data analysis, the nominal data must be converted to something meaningful, following Creswell's (2013) guidelines. Phase one comprised the validation of data, which involves fraud prevention by ensuring that an actual person is answering the questionnaire. The screening was to ensure all participants were included with consideration of the research criteria; therefore, the questionnaire was sent via an email to each SME. The completeness of the questionnaire was ensured by a tool that marks all questions as required to process the questionnaire as complete.

Phase two comprised data editing which is usually used due to the numerous mistakes or incomplete questions. When the questionnaires had been answered, the researcher confirmed that the data was free of these errors by doing the necessary checks to edit the raw data on the Statistical Package for the Social Sciences (SPSS) and create readiness for analysis.

The last phase involved grouping and designating values to the participant responses to ensure ease of data analysis (Creswell & Creswell, 2005). The researcher utilised SPSS for the analysis of data.

The quantitative data was evaluated using descriptive and inferential statistics. Descriptive statistics described the population being studied (Byrne, 2007). Inferential statistics testing is used to test hypotheses (Byrne, 2007). This method of analysis allowed the researcher to understand the dataset by obtaining a general pattern about SMEs through the sample

chosen. It analysed the data by evaluating the four e-commerce resources, using frequency, median, mean, mode, range, standard deviation, variance, chi-square, and advanced inferential techniques. Multiple regression analysis was applied in this study as this technique was used to analyse the relationships with four independent variables and only one dependent variable (Snell, 2020). Multiple regression techniques used the statistics of the independent variables to forecast the data of the sole dependent variable. In this research, the sole dependent variable was the growth of e-commerce.

For the qualitative section the researcher used thematic analysis with a deductive approach, which according to Braun and Clarke (2006) is generally applied to a set of interview records since it thoroughly studies the dataset collected to pinpoint themes and patterns that are repeated. Thematic analysis possesses the influence to reveal the business owner's experiences and viewpoints on the impact of the resurgence of e-commerce on their business whilst still monitoring the truth and realism of the situation (Miles & Huberman, 1984; Braun & Clarke, 2006). It also involves the identification of themes and repetitions that appear to be significant to the description of the facts by wisely reading through the data repetitively (Humble & Mozelius, 2022).

The analysis of the qualitative data involved the process of thematic analysis in this study which included familiarisation of the data and reading through it thoroughly (Leedy and Ormrod, 2015). Microsoft excel was used to code, arrange information and to analyse the qualitative data (Bree & Gallagher, 2016). The researcher followed a process whereby the data was coded with keywords to fit the conceptual framework, which included the areas of broadband, e-shop, digital payments, and logistics, in relation to the growth of e-commerce. After the codes had been generated, patterns were identified, and themes were extracted (Creswell, 2013). The themes were then reviewed making certain the themes clearly represent whatever was in the data. During the write-up of the data analysis, the results addressed each theme and revealed how the data analysis answered the research questions (Neuendorf, 2018; Taherdoost, 2016). The thematic analysis process is further unpacked in detail in Chapter 4.

1.18. Scope and delimitations of the study

This study was conducted to establish the obstacles encountered with the e-commerce resources, and how those hurdles impacted the growth of e-commerce among SMEs in South Africa during the pandemic. The respondents were local businesses in Edenvale South

Africa, specifically the retail industry businesses that are compatible with e-commerce and able to use digital platforms. SMEs that do not incorporate e-commerce platforms in their business were not investigated in this research. The researcher focused on four resources that relate to the growth of e-commerce in SMEs: broadband usage, the e-shop platform for products and services, digital payments, and logistics.

1.19. Contribution to knowledge

Covid-19 gave birth to an unanticipated evolution in e-commerce and the pandemic has reinforced the importance of addressing the existing and new challenges that negatively impact the growth of e-commerce among SMEs in South Africa. This research will provide strategies needed for survival or recovery among SMEs to leverage opportunities during a pandemic. This study will contribute knowledge towards assisting SMEs owners that have adopted e-commerce in their daily business activities, the recommendations on how to use e-commerce resources efficiently, should a pandemic or disruption occur, organisations will be better and well equipped to continue as normal, and not have to shut down or retrench employees. This research will also assist in improving managerial decision-making with respect to e-commerce and provide solutions for business owners to digitise fast enough and close the digital divide by growing businesses online and accelerating digital transformation capabilities in South Africa. The conclusions from this research should make an important contribution to the SME e-commerce retail industry in South Africa.

Based on the findings of this study, SME owner-managers should seek expert advice on Wi-Fi routers to gain a proficient internet infrastructure. SME owners should invest in digital training skills for their business personnel, with taking into consideration the suitable digital systems that build up infrastructure to support the business needs. Knowledge and learning should be developed in every SME in terms of digital payments and logistics, as these proved to have a direct impact on the growth of e-commerce. An advancement course on cybersecurity and safety with digital payments for the business and protection of consumers using the e-shop platform could assist in boosting e-commerce sales. Additionally, according to the results in this study, when goods are delivered efficiently during a pandemic, it directly impacts the growth of e-commerce, therefore, SME owners should invest in streamlining the supply chain from end to end. Managers should set aside time to find the digital flaws in their business and rectify in preparation for a robust and resilient online business for the future.

1.20. Overview of the research

The chapters covered in this study are outlined below.

Chapter 1:

The introduction, background, rationale of the study, problem statement, aim and objectives, and delimitations of the study are included in this chapter.

Chapter 2:

This chapter includes the literature review, with relevant secondary data and information with regards to e-commerce during the pandemic.

Chapter 3:

This chapter includes all the theories that developed the conceptual framework that supports the study and contributes to the research hypotheses.

Chapter 4:

This chapter presents the research methodology of the entire research, which includes all aspects of the mixed-methods study.

Chapter 5:

The result findings are reported and interpreted in this chapter.

Chapter 6:

This chapter includes the discussions of the findings

Chapter 7:

This chapter presents the conclusions and recommendations of the study.

1.21. Summary

The acceleration of development in technology and consumer expectations, during the Covid-19 pandemic, caused many businesses to shift their operations to meet the demand. However, the pandemic surfaced many challenges with e-commerce among SMEs in South Africa and brought about the need for in-depth research.

This chapter outlined the background, rationale, aim and objectives of this study, coupled with a clear demarcation and core focus of the study. A brief literature review and a brief methodology was also introduced.

The next chapter critically reviews the literature on e-commerce challenges prior and during the pandemic.

CHAPTER 2:

LITERATURE REVIEW

2.1. Introduction

The novel Covid-19 generated a shock to all businesses, globally and nationally, to rapidly digitise their operations (Reuschl et al., 2022). Globally, the impact of Covid-19 among small and medium-sized enterprises (SMEs) was a tragedy (Omar et al., 2020). The crisis interrupted the way of living with unique consequences to the daily lives of individuals (Ibn-Mohammed et al., 2021). The global population migrated to e-commerce platforms for their daily business and other needs, and it was imperative for SMEs around the world to deliver a seamless and sensational experience to consumers (Ibn-Mohammed et al., 2021).

The Covid-19 pandemic pushed businesses worldwide to work in collaboration in new ways, which created a global innovation (Schwab & Malleret, 2020). Worldwide lockdowns swept through countries in each continent as governments implemented a stay-at-home regulation (Zahra, 2021). Buying and selling online became the only option (UNCTAD, 2020). As individuals began losing their loved ones, people became more and more fearful of contracting the deadly virus (Luo et al., 2021). The world population became totally reliant on the internet and e-commerce to do everything (Butt, 2021). Communication, working from home, schooling of children from home, conducting business from home, and purchasing goods and items from home all required an accessible, reliant broadband, which was not available to or possible for everyone; therefore, it was very challenging for many to deal with the daily demands of life during the pandemic (Berners-Lee, 2020).

In a developing country like South Africa, e-commerce has become immensely important among SMEs in order to survive (Jere & Ngidi, 2020). SMEs in South Africa are the lifeblood of the economy and high-quality e-commerce platforms are essential for businesses and consumers to participate in the new normal (Kalidas et al., 2020). SMEs in South Africa are also slowly recognising the significance of an effective e-commerce platform (Kalidas et al., 2020). Most nations internationally allowed unrestricted e-commerce during the pandemic due to the non-contact nature of the business; however, the converse happened in South Africa, despite e-commerce being emphasised to control the impact of the crisis (Hanson et al., 2020). Amongst others, Fafunwa (2020) postulated that the Covid-19

pandemic in South Africa revealed an enormous gap in e-commerce among SMEs, as when the crisis hit, all the challenges in the e-commerce process were exposed.

This literature review offers a critical examination of the extant literature on the four e-commerce resources of the e-commerce process and the impact of Covid-19 on the growth of e-commerce among SMEs. The literature uncovers the challenges faced through the pandemic with each of the e-commerce resources and unpacks the moderating variables of the resources. The research coherently demonstrates the theories developed over time and illustrates the use of it in this study. The gap in the literature became evident when the coronavirus pandemic impacted the world and many South African SMEs lacked agility and failed to digitally adapt through the pandemic (Kalidas et al., 2020). This challenge caused many SMEs to shut down, which directly impacted the South African economy and the national GDP. Given the importance of SMEs in the country and the urgency to transform digitally to adopt e-commerce in their daily operations, it was imperative to gain insight into the challenges faced with the e-commerce process and developing solutions to assist SMEs to better manage future disruptions (Naidoo, 2021).

This chapter presents a pragmatic review of the impact of Covid-19 on e-commerce among SMEs globally and in South Africa. Following this overview, pertinent literature on broadband, e-shop features, digital payments, and logistics is discussed comprehensively and critically.

2.2. Structure of the literature review

The review of the literature has been organised into a specific structure which is illustrated Figure 2.1 below.

As per Figure 2.1, the chapter begins with a review of the impact of Covid-19 on e-commerce among retail businesses globally and nationally, followed by an evaluation of literature on the e-commerce resources and capabilities. The literature introduces the Covid-19 pandemic, SMEs, and reveals some of the challenges that SME owners/managers faced with digitising their operations. The review also critically analyses the e-commerce process in detail, unpacking the all the parts that impacted the retail SME sector the most. An examination of the moderating variables in relation to the growth of e-commerce is also conducted to formulate the hypotheses.

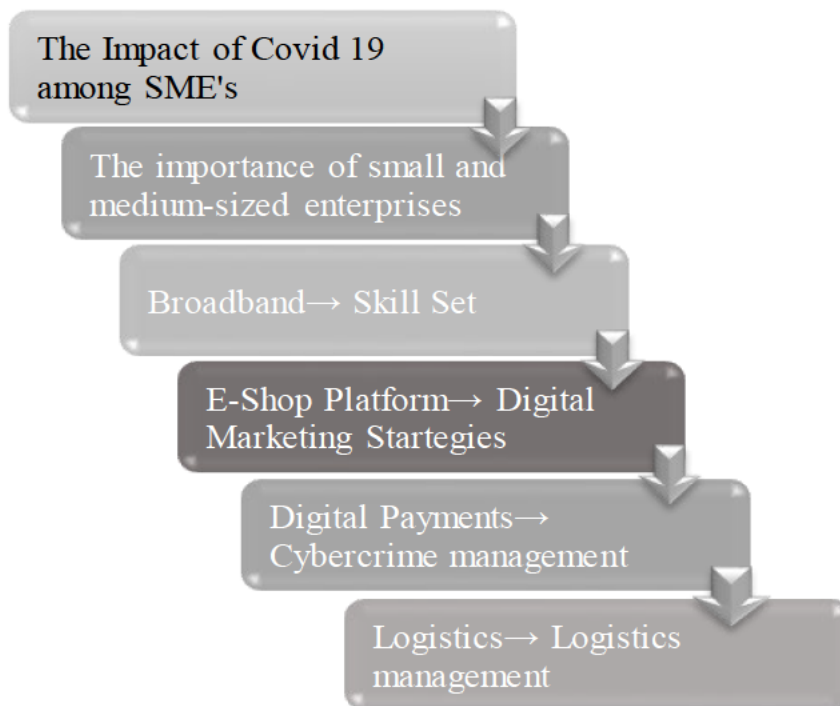


Figure 2.1: Structure of the literature review

Source: Developed by researcher, 2023

2.3. The importance of small and medium-sized enterprises (SMEs)

Small and medium-sized enterprises are firms that maintain revenues, assets or number of employees below a certain threshold (Mohan & Ali, 2019). There are 2.6 million SMEs in South Africa, and approximately 37% are considered formal (Statista, 2023a). The SME landscape is characterised by a divide between formal urban enterprises located closer to developed business, and less formal which are located in rural communities (Statista, 2023a). These two segments experience challenges with power supply, crime, municipal, provincial and national services, expensive transport and poor, pricey and inadequately distributed internet connectivity (Statista, 2023a). Furthermore, these two segments struggle to attract skills and there is a lack of infrastructure, connectivity and logistics networks. South Africa's SME sector is critically important because it holds the key to growth, inclusion and long-term social stability (Kalidas et al., 2020).

Globally, the concept of SMEs and entrepreneurship expansion began during the 1940s (Jeannet et al., 2021). The World Bank revealed that SMEs contribute to the global economy and are crucial for competition in the market (Naradda Gamage et al., 2020). SMEs are an engine for sustainable economic growth and play an important role for poverty reduction, creating employment opportunities, boosting innovation, exports and business skills,

especially in developing countries (Naradda Gamage et al., 2020). SMEs also produce goods and services, affordable for the low and medium LSM citizens, assisting the poor to survive. Globally, SMEs represent approximately 90% of businesses and about 70% of employment (ILO, 2021).

SMEs are fundamental participants in a global landscape, especially in emerging economies like South Africa (Robb et al., 2020). South African SMEs play a pivotal role for an uplifting future and comprise above 98% of businesses and provide employment for approximately 60% of South Africa's workforce throughout all sectors (Kalidas et al., 2020). SMEs in South Africa are also responsible for 25.8% of employment creation in the private sector and contribute 39% to the national GDP (Kalidas et al., 2020). Orzes et al. (2020) emphasised that SMEs globally concentrate on products that have minimal cost and less resource rudiments.

Many factors impact the profitability of SMEs, and the Covid-19 pandemic enhanced the struggles that SMEs faced (Naidoo, 2021).

2.4. The impact of Covid-19 on e-commerce among SMEs

E-commerce is the process of selling goods and services over the internet. Customers visit the website and purchase products using electronic payments. Upon receiving the money, the merchant ships the goods or provides the service (Lund et al., 2020).

Globally, there was a resurgence of e-commerce due to the Covid-19 pandemic (Susmitha, 2021). E-commerce was accelerated and enhanced as businesses and consumers shifted completely to online platforms to conduct daily operations (Abdelrhim & Elsayed, 2020). Businesses large and small had to transform their business models to adapt to an online presence. Due to lockdown regulations, all consumers, suppliers, and businesses had to use infrastructure to implement e-commerce in their operations (Sardjono et al., 2021). Most large enterprises and employees adapted digitally and continued their business functions (Gokila, 2021); however, many SMEs were not agile and resilient enough to withstand the blow of the pandemic and many were forced to shut down (Fitriasari, 2020).

The Covid-19 pandemic put the world into an economic recession (Roy & Das, 2020) and globally there was a catastrophic impact on e-commerce among SMEs (Lund et al., 2020; Fitriasari, 2020). E-commerce is the purchasing and selling of merchandise over the internet and was widely acknowledged for the potential benefits for SMEs (UNCTAD, 2020; Gupta et al., 2022). If e-commerce is utilised properly, it could provide increased consumer loyalty,

extended market share and reach, reduced cost, reduced time processing, and increases in sales and productivity (Lestari et al., 2021). It incorporates various tools and systems for online sellers and buyers, including mobile shopping and digital payment encryption (Gupta et al., 2022). SMEs are the substratum of all economies, especially in developing countries, and contribute greatly to unemployment reduction, job creation and positive GDP value (Dumitriu, 2020).

Government regulations across the world limited most activities in stages, including physical and social distancing, to lockdown measures (Roy & Das, 2020). Due to these measures, many citizens, nationally and globally, could not conduct their typical business networking face-to-face with consumers (Ibn-Mohammed et al., 2021). The period of the pandemic was uncertain and began to threaten the survival and sustainability of SMEs (Naidoo, 2021).

As the population worldwide moved their lives to online platforms, many SMEs were not able to adapt and continue business (Lund et al., 2020). Retailers had no choice but to close their doors, and households bunkered cash in fear of their jobs and incomes being lost (Ragoussis & Timmis, 2022). According to the ILO, the destruction caused by the Covid-19 pandemic on the global labour market was much worse than originally predicted (Ragoussis & Timmis, 2022). According to Lu et al. (2020), China had an enormous impact on cash flow among SMEs worldwide when the lockdown regulations limited exports and imports from the country.

As seen in Figure 2.2, the amount of cash hoarding was on a rise and research debunked the belief that the Covid-19 pandemic accelerated the end of paper money due to e-commerce and fear of obtaining the virus (Ardizzi et al., 2020). The bank of international settlements reinforced those conclusions by providing information of cash holdings in some economies, which impacted the growth of e-commerce (Dvořák et al., 2021).

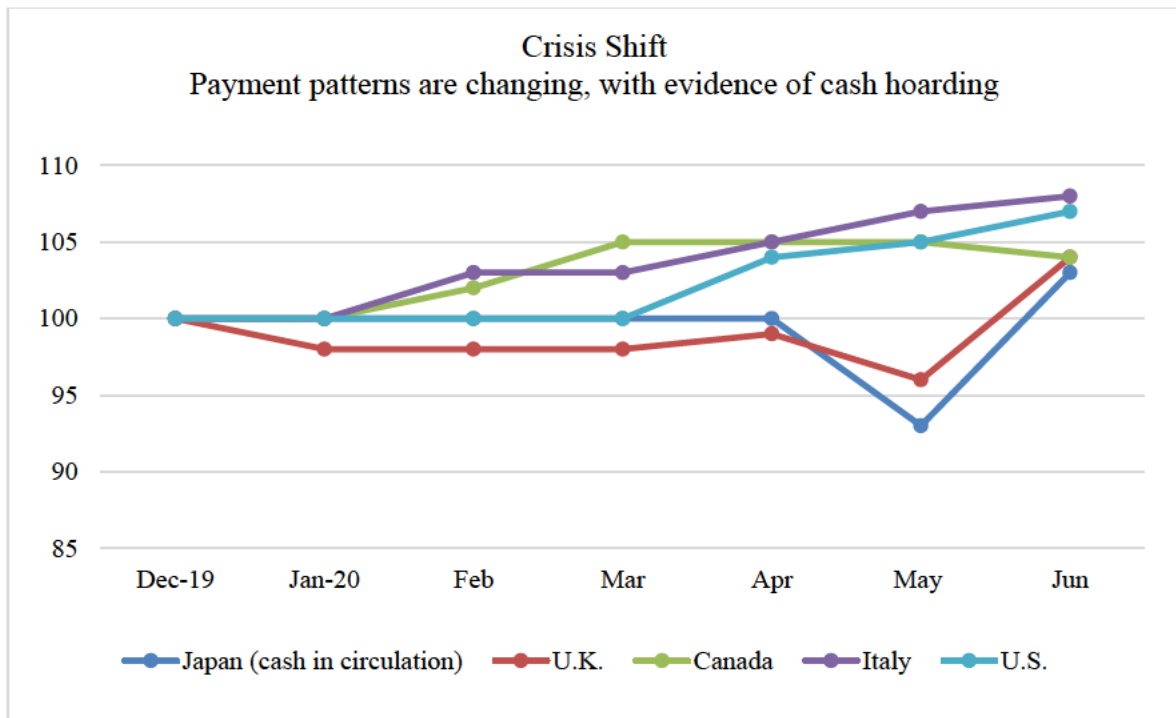


Figure 2.2: Payment patterns and indication of cash storing

Source: Adapted from Bank of International Settlements (BIS), 2020

From the South African perspective, where unemployment, poverty and inequality remain as challenges, the e-commerce platform has the potential to significantly progress the lives of South Africans business owners and the ability to utilise this tool pertinently, especially among SMEs, could create financially sustainable SMEs (Mhlanga & Denhere, 2020). However, several SME owners/managers in South Africa did not see the benefit of this tool and did not invest in it (Naidoo, 2021).

The SME sector in South Africa experienced an economic bloodbath during the beginning of the lockdown, with 60% of permanent employment lost, 68% of that was SMEs that shut down during lockdown and 32% of that was the SMEs that survived the lockdown (Kalidas et al., 2020).

As seen in Figure 2.3, the sectors most severely affected by the lockdown were construction, hospitality and food and beverage restaurants. The sectors that remained in business through the pandemic were retail and IT.

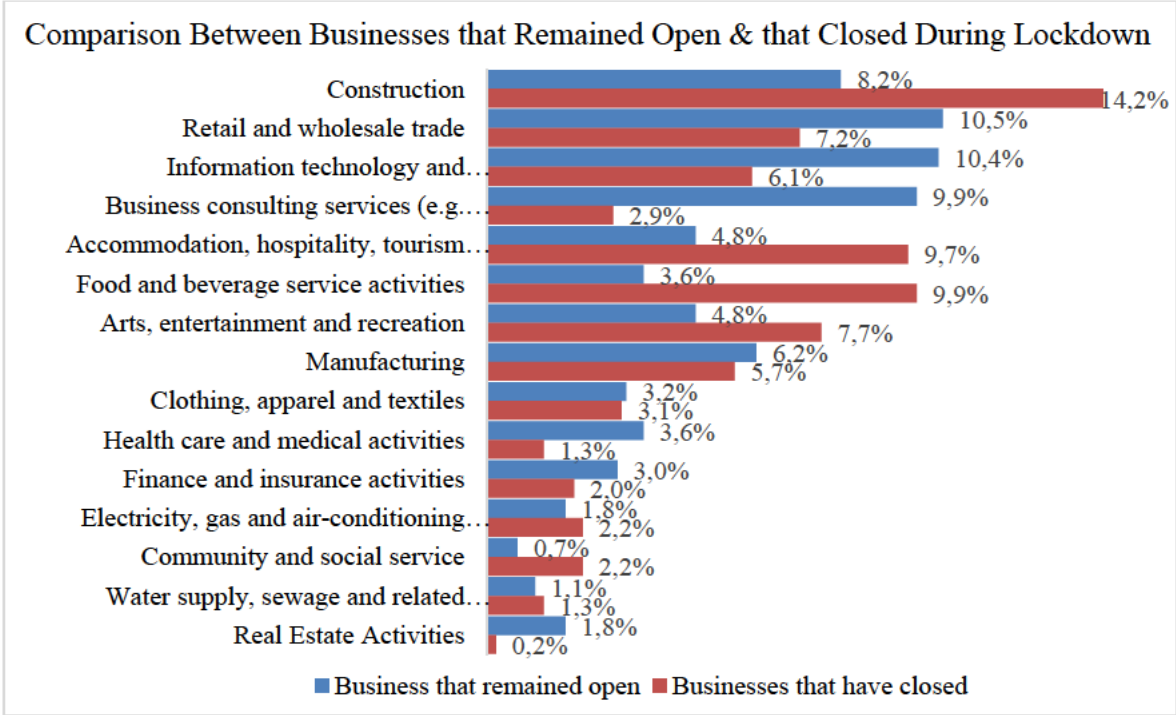


Figure 2.3: Comparison between businesses that remained closed and open during lockdown

Source: Adapted from Bartik et al., 2020

Research showed that SMEs were not equipped for adopting e-commerce during lockdown (Lestari et al., 2021). Trawnih et al. (2021) reported that some SMEs established a Facebook presence, and a few had websites. Furthermore, 58% of the SMEs never had an online meeting, and only 40% used paid digital marketing. Additionally, the excessive cost of data became an obstacle for SMEs to do business online (Berners-Lee, 2020).

According to most literature, over time, SMEs play a critical role in the worldwide economy and form a significant segment of an attempt to recover the economy (Tuan, 2020; Maksum et al., 2020). In both developed and developing countries, SMEs account for approximately 90% of all businesses (Albaz et al., 2020). Furthermore, in emerging and developed countries, SMEs contribute between 40-60% of the global GDP (Riadi et al., 2022).

The Covid-19 pandemic and lockdown regulations enforced by governments triggered economic adversity throughout the world, especially for SMEs in retail (Ozili, 2020). As China tightened the trade boundaries, this regulation had an enormous impact on the economy (Lu et al., 2020). According to Lu et al. (2020), the pandemic control measures had a significant impact on income among SMEs. Lestari et al. (2021) argued that the pandemic created an adverse impact on the aptitude of entrepreneurs in the United Kingdom (UK) to get business funding and reduced the enthusiasm to adopt e-commerce. The

pandemic also aggravated the Indonesian problems prior to the Covid-19 pandemic, such as digital division (Lestari et al., 2021). Omar et al. (2020) elaborated that SMEs were expected to have a chance of survival during the pandemic if they were agile enough to adopt e-commerce

Mota and Cilento (2020) reported that the use of the internet and social media was heavily pressurised as the entire world was dependent on it for everything throughout the Covid-19 pandemic. E-commerce platforms required the internet to buy or sell products or services (Mohan & Ali, 2019).

During the Covid-19 pandemic, the United States (US) retail sales in April 2020 decreased by 7.7% compared to April 2019; however, the e-commerce retailers increased sales by 16%. In the European Union (EU), retail sales via e-commerce rose drastically by 30% in April 2020, in comparison to April 2019 (Rudan, 2020; Tofan & Bostan, 2022; Carlisle et al., 2021). In UK, the e-commerce trade transactions grew to 31.3% between the first and second quarter of 2020.

As shown in Figure 2.4, the US and UK data reveals that businesses and consumers increased their buying from e-commerce platforms from quarter two in the year 2020.

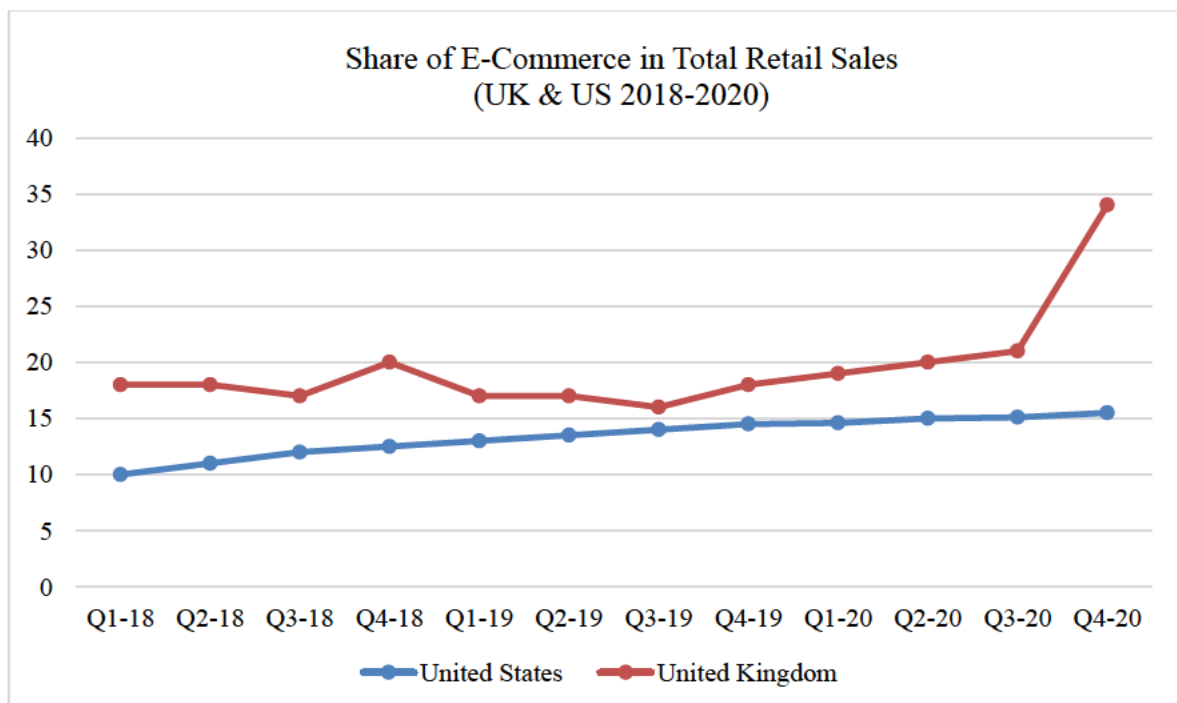


Figure 2.4: Total retail sales in e-commerce

Source: Adapted from Taranenko et al., 2021

It is evident from Figure 2.5 that in developed countries in the EU, businesses utilised e-commerce during the pandemic. This was due to infrastructure and government support, which enabled the EU to adapt faster than the developing countries with no infrastructure.

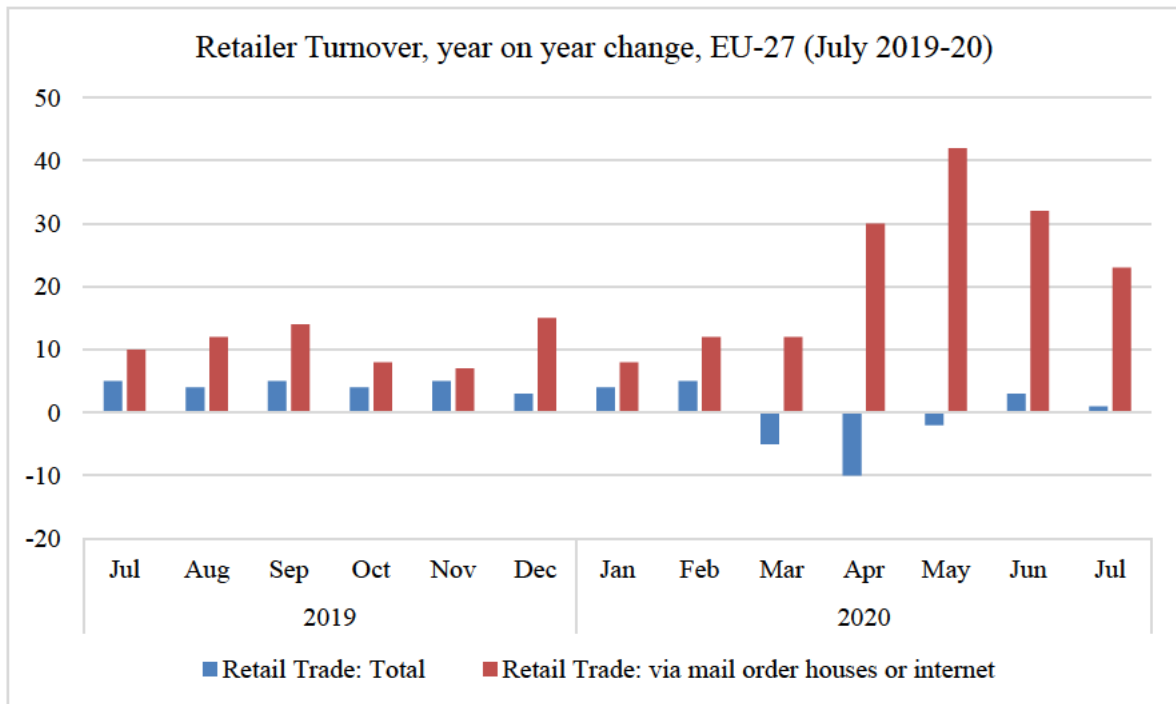


Figure 2.5: Retail turnover – year-on-year change in the EU

Source: Adapted from Taranenko et al., 2021

As depicted in Figure 2.6, the greatest rate of e-commerce adoption globally was found in T2, when the coronavirus pandemic caused nations to stay at home under lockdown regulations.

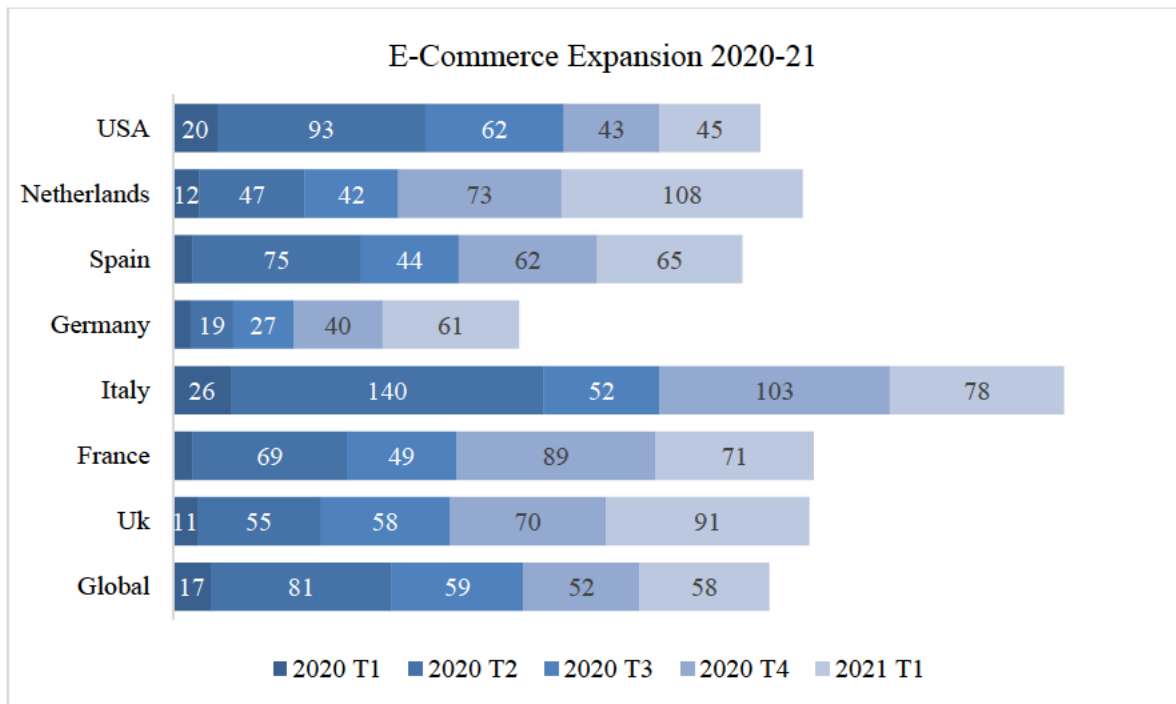


Figure 2.6: E-commerce adoption globally among SMEs during Covid-19

Source: Adapted from Taranenko et al., 2021

According to Business Insider South Africa, indicators revealed that e-commerce in South Africa increased by 66% in the year 2020 in comparison to 2019. The formal business segment is governed by SMEs, and even though there was such a significant increase in adopting e-commerce in business operations, these numbers were found mostly amongst the larger enterprises as SMEs didn't have the infrastructure to support this (Kalidas et al., 2020; Naidoo, 2021). This situation accentuates the critical need to use the larger enterprises as an example and benchmark to follow and reap the benefits of e-commerce (Jere & Ngidi, 2020). The novel Covid-19 pandemic forced South African businesses to change their operations from face-to-face to online, in order to survive (Eynon, 2021), and many businesses that were not equipped to implement e-commerce in their trading model, shut down (Costa & Castro, 2021; Deshmukh & Thadakamalla, Johnston, 2021; Khan et al., 2021; Sumarliah et al., 2022; Tokar et al., 2021).

Due to most consumers also working from home, shopping online became a necessity (Netshirando et al., 2021) and consumers expected a safe, secure, and easy to use platform with the variety of products being available (Pentz et al., 2020). However, safety and security could not be assured by SMEs during the pandemic, as cybercrime was at its peak, and even with great effort to prevent it, crime was inevitable (Kurshan & Shen, 2020; Ma & McKinnon, 2021). Tronvoll et al. (2020) implied that digital marketing strategies on the e-

shop platform were not applied by SMEs due to lack of skills set and lack of awareness that these tools attract consumers. Customers also desired a personal experience, similar to going into the brick-and-mortar stores, and being able to touch and feel the products (Netshirando et al., 2021). Many consumers preferred in-store shopping as they were able to walk out with the goods which they had personally selected themselves. Conversely, throughout the pandemic, unfulfilled order deliveries became a norm, as the demand was too high for logistics to manage (Kushwaha, 2021; Montoya-Torres et al., 2021; Orji & Okwu, 2021).

The crisis impacted SMEs due to social distancing, disrupted supply chains, communication, jobs, access to the internet, and digital transformation. The e-commerce platform played a strategic part for success among SMEs through the pandemic. An effective and efficient e-commerce process supports the growth of e-commerce and can contribute to the life of the economy. Therefore, since the engagement and usage of e-commerce are both crucial for SMEs to adopt, the next section focuses on the process of e-commerce.

2.5. The e-commerce process

The e-commerce process entails purchasing and selling goods, products, or services on an e-shop platform, through the internet (Gokila, 2021; Gusarova et al., 2021). The e-commerce process starts with accessing reliable broadband in order to create an e-shop platform with products and services (Tofan & Bostan, 2022; Szyjewski, 2019). Businesses then adopt digital payments for consumers to pay for the product or service and the goods are transported to the customer (Chaveesuk et al., 2022; Montoya-Torres et al., 2021). The Covid-19 pandemic exposed challenges in all aspects of e-commerce. The e-commerce process comprises a firm link of elements and if one link is challenged, the entire process and growth will be hindered (Gokila, 2021).

Figure 2.7 illustrates the four major resources that directly affect the usage and growth of e-commerce, namely broadband, e-shop, digital payments, and logistics. If any one of these elements is missing, the e-commerce purchase is incomplete, when then impacts the growth of e-commerce. The efficiency and effectiveness of broadband accessibility in business are crucial for growth of e-commerce as without the access to broadband, the rest of the process cannot take place. Hence, it is important as a first step to examine the challenges of broadband during the Covid-19 pandemic.

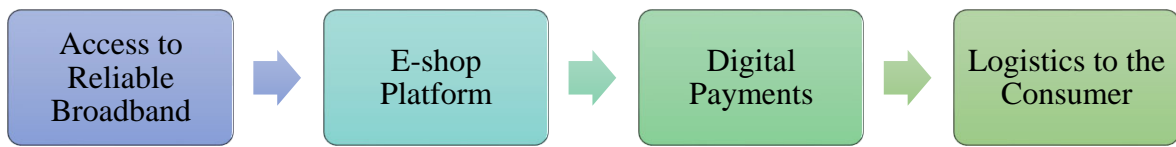


Figure 2.7: The e-commerce process

Source: Developed by researcher, 2023

2.5.1. Broadband

The pandemic led to global analyst experts predicting that the world would face the worst recession since the end of World War II (Gamlen, 2020). The Covid-19 pandemic also emphasised the critical role of internet connectivity to keep businesses functioning as using the internet to do everything became the new way of life (Berners-Lee, 2020). When the pandemic hit the world, it became a lynchpin to galvanise comprehensive universal action to spread out digital connectivity to as many as possible (Rey-Moreno & Pather, 2020; Oughton et al., 2021). It became very obvious that populations that are unserved or partly served by broadband cannot obtain value provided by access to e-commerce (Rey-Moreno & Pather, 2020).

Globally, billions of citizens were moving to online platforms to stay in touch during the Covid-19 pandemic; however, approximately 50% of the worldwide population did not have access to the internet (Mora, 2021; Clark & Wedeman, 2021; Claffy et al., 2020; Oughton et al., 2021). This was a big obstacle as it is essential to have reliable internet access to do business or shop online (Tofan & Bostan, 2022).

Rajabiun (2020) indicated that the diffusion of the internet is depicted as the technology that permits rapid transmission of data and is intricately linked to the development of broadband. Broadband was initially opened through dial-up means, until consumers' and organisations' demand rose for the development of higher speed technologies (Price et al., 2018). In the 22nd century, there are a wide variety of options available for SMEs to utilise broadband in their businesses and homes (Wynn & Olayinka, 2021).

The coronavirus pandemic brought total dependence on broadband for businesses to keep operating (Sharfuddin, 2020). However, many SMEs could not afford high-speed broadband, and many were digitally illiterate (Hanson et al., 2020; Fafunwa, 2020). While

many large businesses have the advantage of access to high-speed connectivity, numerous SMEs especially in developing countries do not have this privilege (Ayodele, 2020; Lewis, 2020). In Sub-Saharan Africa (SSA), an average of only 7% use the internet for business purposes (Fafunwa, 2020). Additionally, the benefits of technology infrastructure for handling the blow of the Covid-19 pandemic are restricted only to the business industries that are currently transforming digitally (Ismail, 2020). For example, supply chains have become moderately resilient with the assistance from digital technology; however, this is less positive for those businesses in developing countries (Jamil, 2021). Therefore, businesses need to tackle the problem of the digital divide (Randell-Moon & Hynes, 2022).

The rate of deployment of networks, impacted countries differently during the Covid-19 pandemic in 2020. 5G population coverage in emergent economies was embryonic, with Eastern Europe at 16.4%, 3.2% in Latin America, 15% in Asia-pacific, and 0% in SSA (Curwen & Whalley, 2021).

Henderson et al. (2021) implied that a state-of-the-art digital infrastructure supports a nation's economy in radical ways. This facilitates the movement of merchandise, assists in exports, and guarantees the distribution of public services to the people (Mothobi & Grzybowski, 2017). Telecommunication networks or broadband are the support pillar of a modern digital infrastructure (Gerli et al., 2020). This network is designed around three components: international network, which enables the country's connectivity globally via submarine cables or fibre optic networks; domestic communication network, which supports the passage of signals in urban areas via fibre-optic or satellites; and access networks, utilised to extend to the last mile of internet users via fibre-optic and wireless networks (Majid Gilani & Faccia, 2021; Zhou et al., 2022; Gerli et al., 2020). The technology of broadband networks has been advancing in time, such as wireless networks, 2G, 3G, 4G and 5G (Storck & Duarte-Figueiredo, 2020). Digital infrastructure is a lynchpin of the digital economy.

As seen in Figure 2.8 below, the structure of digital services offers people, SMEs and government access to digital content and services (Xie et al., 2020). It provides connectivity to all involved in the digital value chain, for example internet platforms such as e-commerce, so that it can supply significant value to its users (Gerli et al., 2020). If social and economic demands are not met through the infrastructure, then the entire digital economy will be impacted negatively (Majid Gilani & Faccia, 2021). Therefore, it is crucial to analyse the performance of broadband in reaction to the Covid-19 interruption.

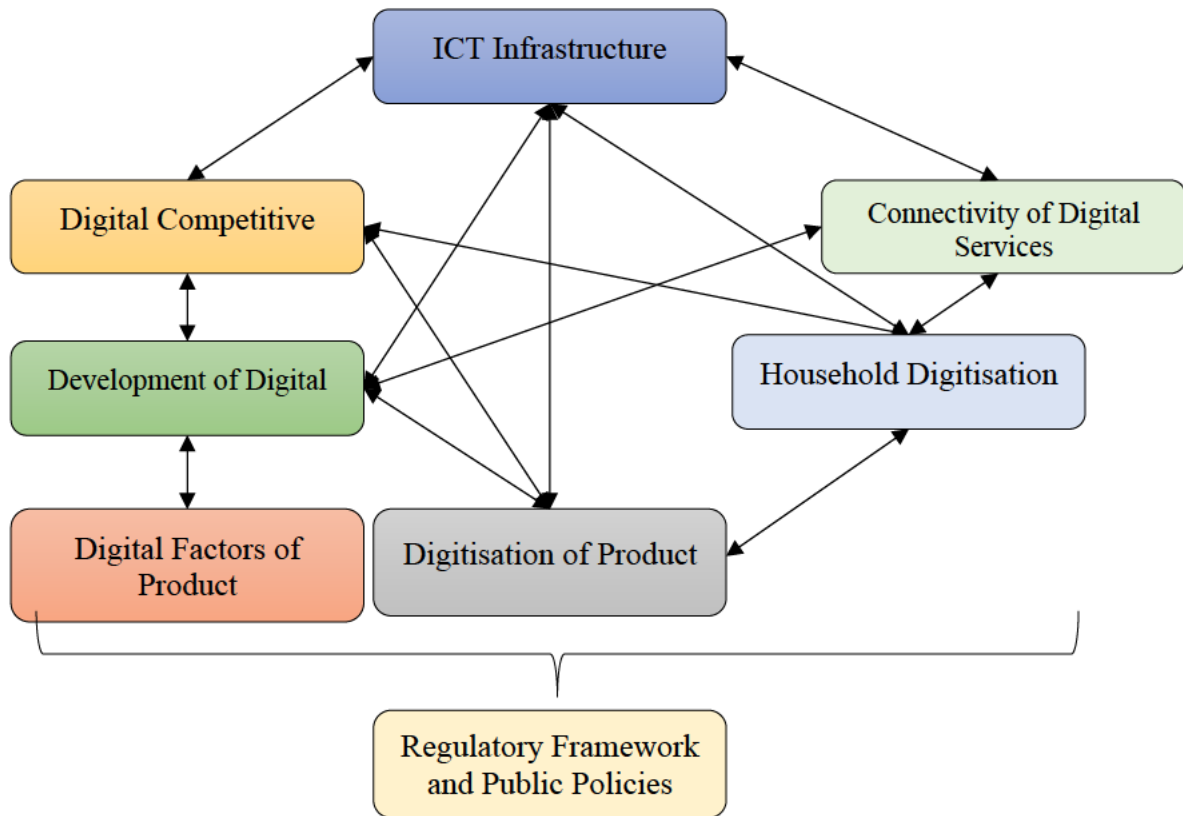


Figure 2.8: Structure of the digital economy

Source: Adapted from Taranenko et al., 2021

2.5.1.1. Impact of traffic changes on broadband

The implementation of preventative hygiene measures to handle the Covid-19 virus, such as work, and home quarantine led to a spike in broadband usage (Gokila, 2021). Globally, the broadband traffic inflated by roughly 30% (Wodnicka & Skurpel, 2021). The evolution of working from home shifted the internet traffic to residential areas (Tan et al., 2021). This implies that the data traffic shifted from mobile streaming to fixed Wi-Fi networks (Oughton et al., 2021). The higher the internet diffusion in a nation, the lower the latency and the faster the download speed (Majid Gilani & Faccia, 2021).

The most immediate outcome of the Covid-19 plague was the shutdown of schools, offices and manufacturing facilities to prevent the spread of the virus, which in turn had a ripple effect on the usage of broadband in households (Gupta et al., 2022).

As represented in Figure 2.9, globally the uptake of broadband grew gradually over the years and when Covid-19 struck, the number of internet users increased, although not as high as expected, from a figure of 4.1 billion individuals in 2019 to 4.9 billion people in 2021. Broadband was a foundation for many opportunities, for private accomplishment, skilled

development, and creation of value, like the usage of e-commerce. Nevertheless, many SMEs and people were in a predicament with low infrastructure, not being able to gain internet connectivity and unable to utilise e-commerce to obtain daily needs. There were 390 million citizens globally not even covered by a mobile broadband signal (Majid Gilani & Faccia, 2021).

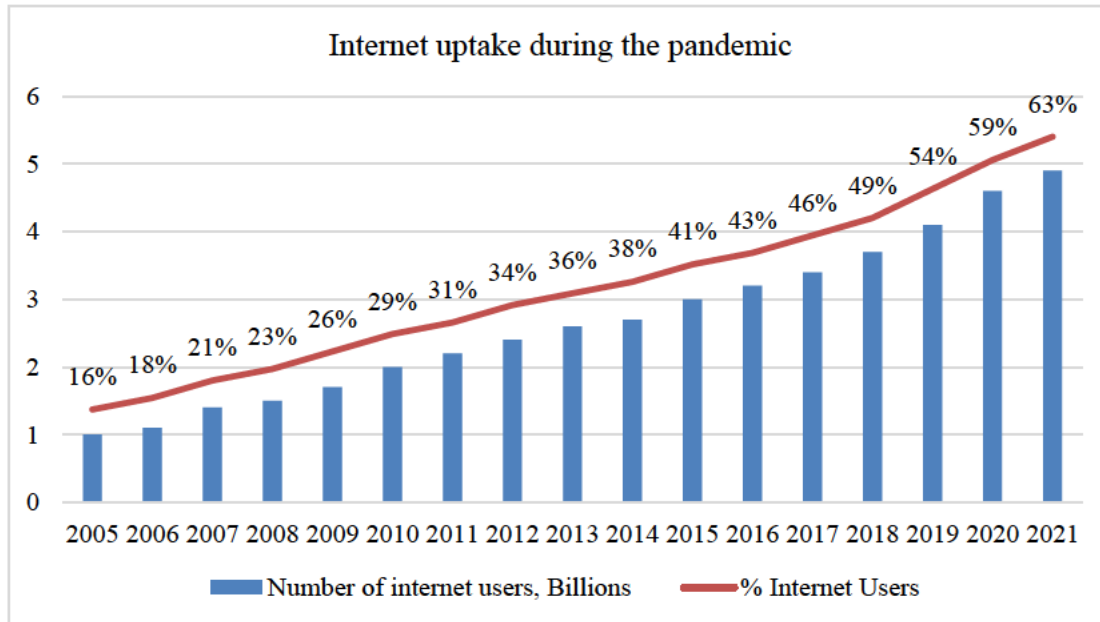


Figure 2.9: Internet uptake during the pandemic

Source: Adapted from Statista, 2020

Ariansyah et al. (2021) highlighted that the internet usage had a more positive influence on economic growth within nations better equipped with the required skills and technology, and thus could use e-commerce to their advantage. Ranasinghe and Herath (2021) demonstrated that broadband had a larger impact on productivity within business with increased transaction costs and high labour intensity, such as finance, travel and accommodation; while Xuhua et al. (2019) argued that in developing countries, broadband enabled the adoption of e-commerce as it is the first element needed to do business online.

Broadband aids e-commerce to be vital within the digital evolution of countries and the Covid-19 pandemic strengthened its function (AlHudaib & Al-Shammari, 2022). During the pandemic, the internet braced online platforms for new channels and sales (Alam et al., 2022). However, SMEs’ application of e-commerce remains comparatively imperfect and slower than larger firms, despite the evidence from preceding literature that using e-commerce in their operations can improve their productivity (Neirotti et al., 2018). Research also indicated the positive impact that SMEs can leverage from e-commerce, like decreased

process costs, and generation of economies of scale, throughout reduced information asymmetry, and outsourcing logistics (Tolstoy et al., 2021).

Among the Organisation for Economic Cooperation and Development (OECD) and the G20 nations, the Covid-19 epidemic triggered an overwhelming pressure on the dependence of broadband and the usage of digital platforms; however, the upsurge varied across industries and nations (Hildenbrand et al., 2021). Online platforms in areas where great broadband activity was needed like marketplace and eatery supply realised an increase in sales of over 20% (Hildenbrand et al., 2021). However, other sectors such as accommodation and travel experienced a sharp decline of about 70% (Napierała et al., 2020). Gupta et al. (2022) stated that countries that had a developed a foundation together with advanced digital knowledge experienced a greater increase. Fafunwa (2020) further noted that participating in these proficiencies can be an approach to grow flexibility to potential shocks in the future. The irregular usage of digital platforms throughout nations is an outcome of the differences in access to digital support like immovable or moveable fast internet (Kaushal & Srivastava, 2021).

When the Covid-19 pandemic arose, broadband was also critical for communication platforms to maintain business meetings and relationships between suppliers and clients (Obrenovic et al., 2020). According to Kalidas et al. (2020), Chartwell Consulting is an SME consulting firm in London that specialises in counselling companies that work within a manufacturing environment. The workers at this firm have digital skills and have used certain techniques to do the daily operations of the company. However, during the Covid-19 pandemic, employees were forced to work from home. The contemporary new normal way of doing business and the market conditions accelerated the business's dependence on broadband together with the tele-networking platforms. The SME increased cloud storage to adapt to tele-networking and digital safety while working on a less safe internet connection. This SME had efficient practices in place throughout the pandemic. However, there were many SMEs, especially in developing countries like South Africa, that couldn't adapt their SMEs digitally through the pandemic and suffered losses (Naidoo, 2021).

Less than one in five individuals in less developed nations were connected to the internet and a direct impact on the penetration of internet usage and e-commerce sales is the cost of data to go online (Li, 2020; Karine, 2021; Gachenge, 2020; Mofokeng, 2021). In a developing country like South Africa, the price of broadband is nearly double that of

broadband in other countries (Kalidas et al., 2020; Aziz et al., 2020; Fenner & Cernev, 2021; Fitriasari, 2020).

Furthermore, within developing nations the access to broadband was also less than expected. In the USA, more than 6% of the populace experienced no high-speed internet connections, which equates to 21 million people and in Australia it affected 13% of the population (Randell-Moon & Hynes, 2022).

As indicated in Figure 2.10, the broadband subscriptions globally have risen over time for most countries; however, according to the United Nations Educational, Scientific and Cultural Organization (UNESCO), globally, only 55% have broadband connection. In the well-established world, 87% have fibre connections in comparison to 47% within emerging countries and only 19% in the least established nations (Jamil, 2021). There are 3.7 billion people around the world who have no internet access (Randell-Moon & Hynes, 2022; Mora, 2021; Myovella et al., 2020; Mossberger et al., 2021). Randell-Moon and Hynes (2022) indicated that many people were forced to work from home during the Covid-19 pandemic; however, many of them were not able to connect or found that their internet was unstable due to the high numbers of individuals utilising the internet.

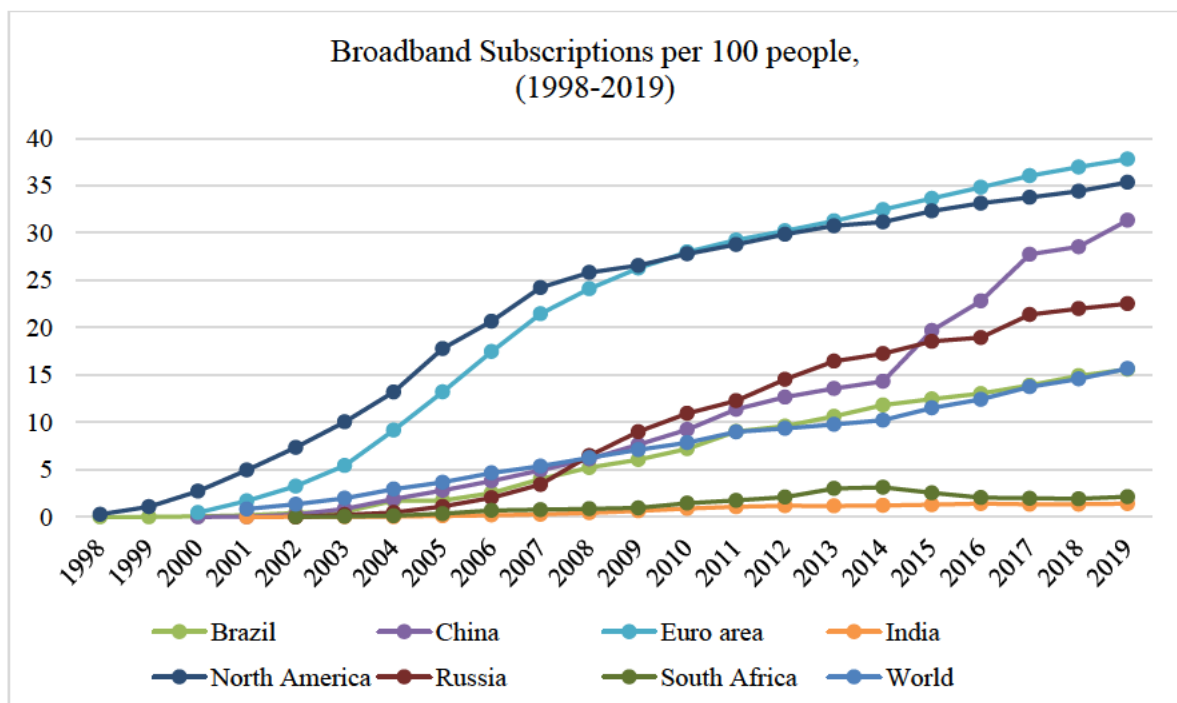


Figure 2.10: Broadband subscriptions globally

Source: Adapted from Our World in Data, 2019

US-based M-Labs observes the worldwide broadband speed, and it was detected that despite the guarantees from web service providers that the network connections should cope with extra load, internet speed decreased in some areas (Clark & Wedeman, 2021, Claffy et al., 2020).

The federal communications commission in the US emphasised that the assessments of the number of Americans with no access to the internet are understated (Clark & Wedeman, 2021; Claffy et al., 2020). The broadband commission, ITU and UNESCO, have targeted to connect 75% of the global population with fast internet services by 2025 (Mora, 2021; Myovella et al., 2020; Mossberger et al., 2021). Even though the usage of mobile technology is rising, the cost of mobile data is significantly higher (Correa et al., 2020; Oughton et al., 2021; Myovella et al., 2020).

Myovella et al. (2020) noted the disadvantage of mobile data costs in the Africa, where one gigabit of data costs approximately 40% of the standard pay. According to the World Bank (2023), almost 85% of Africans earn up to only 5.5 dollars a day, causing a ripple effect on how they utilise e-commerce via the internet. Furthermore, developing countries are not alone in this challenge but so are developed nations such as Australia where one third of the average income segment had no internet connection during the pandemic (Randell-Moon & Hynes, 2022; Jamil, 2021; Mora, 2021).

In Pakistan and Bangladesh, the internet had persistent traffic spikes and consumers complained about the insufficient speed, inadequate reliability, and the stability of internet connections even if they paid more (Aziz et al., 2020). Many citizens found it difficult to work from home and to conduct e-commerce business online due to slow internet speed and numerous disconnections (Randell-Moon & Hynes, 2022; Aziz et al., 2020). Through the pandemic, governments and internet providers in Pakistan, Bangladesh and Bhutan launched many initiatives to assist SMEs to utilise e-commerce in the operations; however, these relief measures were removed very quickly, and SMEs were left trying to use e-commerce with their own funding (Aziz et al., 2020).

Access to broadband has a direct impact on the growth of e-commerce among SMEs and therefore on the GDP growth (Šaković Jovanović et al., 2020; Măiță et al., 2021). Globally, SMEs were aware that there was a digital divide problem prior to Covid-19, but the pandemic illustrated the catastrophe in stark terms (Vahdat, 2021).

The United Nations Broadband Commission for Sustainable Development argued that the worldwide broadband access is an important catalyst that is necessary to enrich global economic recovery and hasten progress towards the United Nations Sustainable Development Goals (Fenner & Cernev, 2021; Yoo & Song, 2021). In fear of not closing the broadband gap, the United Nations are concerned that they may neglect to accomplish the Sustainable Development Goals which aspire to terminate destitution, shield the globe, and guarantee citizens peace and wealth (Fenner & Cernev, 2021).

Berners-Lee (2020), the creator of the internet, the World Wide Web, claimed that “the digital divide won’t disappear once this crisis is over ... we must make sure those currently in the slow lane have the means to catch up. Otherwise, billions will be left behind in the dust”.

Conversely, the Covid-19 pandemic exposed the fact that South Africans didn’t just have a problem accessing the internet but also access to digital devices that enable them to work or use e-commerce platforms to shop or do business (Ismail, 2020). The South African President announced a nationwide lockdown on March 23, 2020, to reduce the number of Covid-19 cases in South Africa. This call had a disproportionately adverse impact on those disadvantaged citizens who were excluded from the digital world (Kalidas et al., 2020; Naidoo, 2021; Jere & Ngidi, 2020).

According to Mothobi and Gillwald (2021), a report from Research ICT Africa revealed that high-speed broadband has a critical function in South Africa. Mora (2021) noted the ambiguity of the pandemic with having internet penetration of only half the country, high priced smart devices, high data prices and low internet connectivity in certain places. Isolation during the Covid-19 pandemic was thus a major challenge, especially among SMEs struggling to adopt e-commerce in their operations.

Mvambo (2021) highlighted the government’s project to provide extensive internet access to 90% of South African people by the year 2020 and 100 % of the population by the year 2030 and confirmed that they are cognisant of its importance; however, the strategy has still not been executed. The venture to provide free broadband access and high speed connectivity in all public buildings remains unfulfilled (Mothobi & Gillwald, 2021). China is the largest optical fibre and cable producer in the world (Lu et al., 2020). During the pandemic, all production and supply of the necessary high speed internet parts, together with the

improbability of the period of the lockdown regulations, caused a ripple effect on project delays across Africa (Mothobi & Gillwald, 2021).

Broadband accessibility requires skills and businesses with staff that have no skill set find it difficult to use the internet (Eynon, 2021). Skill sets support the usage of broadband and the digitisation of businesses. The next sub-section therefore discusses the digital and internet skills during the Covid-19 pandemic.

2.5.1.2. *Skills*

Covid-19 forced SME owner-managers to learn how to manage their staff from a virtual environment without social capital (Bressan et al., 2021; Chapman, 2021). As many SMEs are slowly reverting back to work, new skills are required in order to transition employees digitally (Agrawal et al., 2020).

Ragoussis and Timmis (2022) further noted that many nations successfully embraced the digital transformation to empower a broader economic development. However, South Africa is far down the Universal Telecommunications Union's Information Society Index (Ayodele, 2020), which measures nations' development with regards to information societies grounded on three variables: readiness, intensity, and impact. Readiness is determined by indicators of skills to access the internet (Ayodele, 2020).

The challenge experienced by SMEs during the pandemic was not only how to adopt e-commerce in their business model but how to acquire new e-skills, and how to utilise them properly to combine them with other channels of business (Van Laar et al., 2020). SMEs will be able to overcome many of these barriers when the internet is fully developed into the most useful tool of communication globally (Adam & Alhassan, 2021).

Anim-Yeboah et al. (2020) stressed that a significant gap in skills existed among SMEs' employees to engage in the platforms, together with a need for user-friendly software. Saba et al. (2021) suggested, to circumvent being interrupted by digital platforms and utilise them in the best and most effective way, SMEs could have invested in talent and knowledge expansion to change their business model. Some SMEs like food retailers only require limited skills in capitalising on e-commerce platforms; however, this does not apply to all SME sectors (Gauli, 2021). Liao and Yang (2020) disputed that the old-fashioned traditional SMEs were not ready to create an online presence, and Van Laar et al. (2020) attested that many SMEs need to introduce innovation and skills development to make their businesses digitally ready and use broadband to access e-commerce which means allocating funds for

those investments. Multiple private and public programs are available across borders, which are free or at a low cost (Xie et al., 2021). SMEs could utilise these programs; however, the owner-managers have to be motivated to dedicate time to transform their business model (Xie et al., 2021).

The cost of setting up an e-commerce platform abroad is generally low (Lv et al., 2020). Most platforms in the EU have models that are free for users that adopt e-commerce and offer services at low fees (Oughton et al., 2021). The plain and simple e-shop platforms are generally intended to be exceedingly user friendly and hardly demand specific skills to be functioned (Ehikioya & Guillemot, 2020). However, if SMEs prefer to gain competitive advantage by using the online platforms to their full potential, then the necessary skills are required (Van Deursen et al., 2021). If SMEs want to gain from the social media e-commerce, they will need to escalate traffic on their digital platform through internal training to develop skills to perform those tasks or by hiring specialised professionals who possess those necessary skills (Lv et al., 2020).

Mvambo (2021) noted that the utilisation of broadband to access e-commerce platforms permits SMEs to decrease business transaction costs and communication irregularities. Broadband also enables significant direct and indirect network effects with cumulative consumer bases and international extent which helps to overcome a size-based skills gap (Vellaichamy et al., 2020). Further, broadband creates revolutionary prospects as data shows greater efficiency altitudes in sectors with a high share of SMEs (Henderson et al., 2021). There are substantial trials and risks for SMEs in using broadband to access e-commerce (Kumar & Ayedee, 2020). These include the scarcity of skills and understanding or adequate business models to fully exploit the advantages of digital operations, but also include risks associated to data security and digital safety (Kira et al., 2021).

As reflected in Figure 2.11, the infrastructure problems, which included the internet connection and PC access, together with being digitally literate, were the biggest impediments faced by SMEs when implementing workforce training. Additionally, training programmes that took place digitally exacerbated the vulnerability of employees with low levels of digital literacy and inadequate access to broadband.

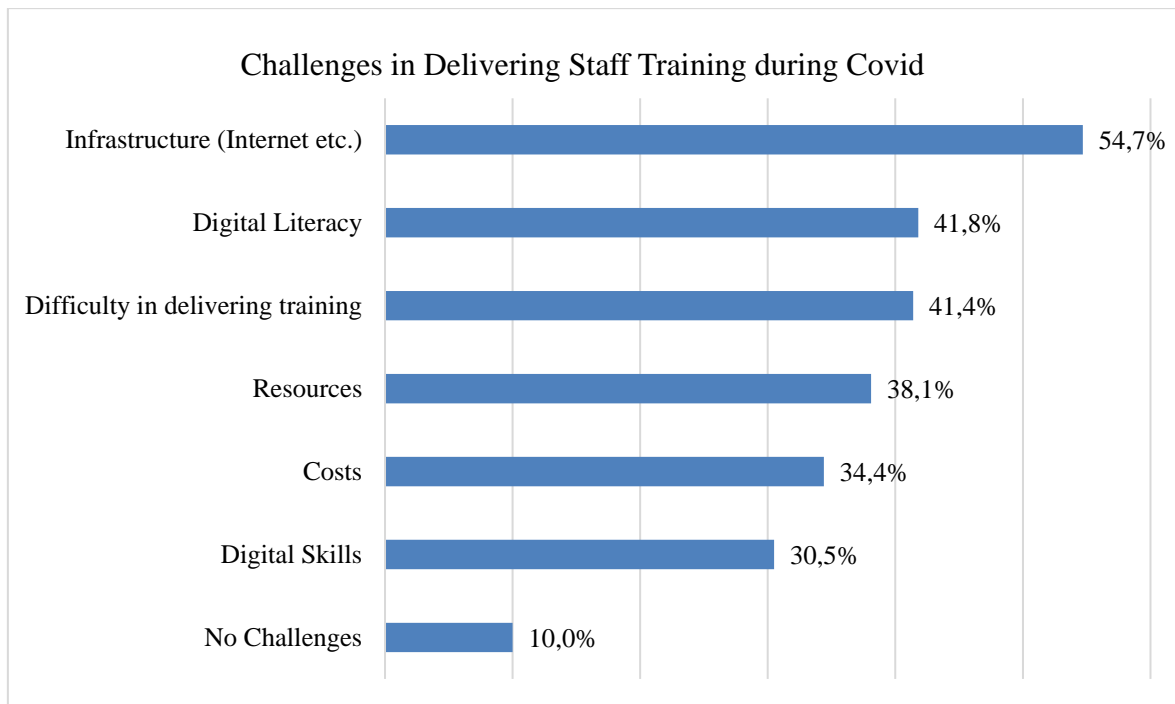


Figure 2.11: Challenges in delivering staff training during Covid

Source: Adapted from International Labour Organization (ILO), 2020

Covid-19 also brought a new landscape of learning through live conferencing (Saba et al., 2021; Van Laar et al., 2020). This transformation has made it possible for SME owner-managers to train their staff in a more cost-effective way, reaching a larger scale of employees at the same time; however, only a small number of SMEs, which had funds and infrastructure, took advantage of this through the pandemic (Wendt et al., 2021). Another aspect to note is that different SME sectors require a different set of skills and training (Wendt et al., 2021). This applied even to banks who had to upskill their staff in compassion as they assisted distraught customers to utilise digital tools with new merchandise and services during Covid-19 (Agrawal et al., 2020; Anderson et al., 2021). It thus becomes evident that the Covid-19 pandemic changed the employment landscape totally which has required large-scale reskilling or upskilling of workers on digital platforms (Agrawal et al., 2020; Anderson et al., 2021; Choudhary & Chintaluri, 2021; Wendt et al., 2021).

However, Agrawal et al. (2020) argued that to face the challenge, SMEs should develop a talent stratagem that could shape employees' critical, digital and cognitive competences. This need has been emphasised by Covid-19 and strengthened the demand for SMEs to increase the education budgets and oblige to reskilling, as evolving that power will also toughen SMEs for future disruptions (Albaz et al., 2020).

SMEs faced an adaptation curve as business owners began to learn to manage and lead their employees digitally. SME owners/managers also attempted to build social capital, even though they lacked the advantage of physical business meetings (Sharfuddin, 2020). As SMEs anticipate reverting to work, a new set of skills is also likely to transpire for the changeover (Kalidas et al., 2020).

An example of coping during a pandemic was illustrated during the Ebola haemorrhagic fever crisis, when an SME in West Africa fixed a target to precipitously refining the aftermath performance (Agrawal et al., 2020). The SME implemented an extensive skill strategy which aided streamlined return to work, initiated new skills and teaching that supported performance, and, functioned to generate a deeply engaged workforce (Agrawal et al., 2020; Carlisle et al., 2021; Singh Dubey et al., 2022). The SME also differentiated which skill was most important for the return and noted that they lacked flexibility. This method relinquished numerous advantages for the business.

Covid-19 fast-tracked the implementation of fully digitised approaches to reinvent the greatest of face-to-face education through live audio-visual and social sharing (Singh Dubey et al., 2022; Saba et al., 2021). New skills were required for the new distance learning and working, by being efficient in using broadband. The crisis hastened the intensities of digitisation to support the reduction of preventable social activity. SMEs had to re-invent work, which caused interruption of jobs and the way it was performed (Xie et al., 2021; Carlisle et al., 2021).

Certain sectors had to train employees with new skills as they transformed their functions to combat the epidemic (Agrawal et al., 2020). For example, customer banks had intensified staff training in precise aspects as the need for refinancing mortgages surged. Senior staff at the banks had to equip personnel in sympathy to assist anxious customers adapting digitally (Alam et al., 2022; Carlisle et al., 2021).

The pandemic caused a rapid rise in online shopping as opposed to traditional stores (Gokila, 2021). Despite the economic downturn, early signs from China revealed that new consumers, particularly those in developing nations, began to shop online in large numbers (Sharfuddin, 2020; Myovella et al., 2020; AlHudaib and Al-Shammari, 2022; Agrawal et al., 2020). Many Chinese executives that were present at a virtual roundtable held in March 2020, expressed their optimistic forecast of consumers that would shift to e-commerce platforms at a rapid pace (Xie et al., 2021; Agrawal et al., 2020; Saba et al., 2021).

The retail and food service industries accounted for 42% of vulnerable jobs in the US, while sectors like groceries added three million jobs (Lund et al., 2020). With the Covid-19 pandemic raging in the United States, Uber launched Work Hub to help their drivers find gig economy jobs, both within the company and at other businesses that were hiring. Companies were able to meet the growing demand for skilled labour due to digital talent marketplaces that facilitated communication between businesses seeking to hire and individuals in need of retraining or reskilling (Agrawal et al., 2020; Lund et al., 2020).

Fitriasari (2020) suggested that SMEs should create a skill set that could assist their organisations in the important components of the business and that could respond well to changes. Changes could include learning the skill to adapt the business model digitally, attain intellectual skills, ability to action the need of innovation, and practise agility and resilience skills to flourish during a developing business situation (Saba et al., 2021; Van Laar et al., 2020; Mota & Cilento, 2020). It is fundamental to create digital skills to succour SMEs to continue operations in an isolated digital era and create success within the organisation by using digital communication between clients, partners, and suppliers (Vellaichamy et al. 2020).

Measuring the access to the internet is much easier than measuring the knowledge and skills that affect the usage of online activities (Van Deursen et al., 2021). Competence in digital media is closely linked to familiarity with the internet (Van Laar et al., 2020). It is possible to characterise internet usage in terms of the activities that people pursue while connected to the network (Correa et al., 2020). Therefore, actions that increase a person's social capital, such as engaging in e-commerce have been considered a parameter of effective internet use (Xie et al., 2021; Saba et al., 2021). Mota and Cilento (2020) argued that internet use could add to SMEs' empowerment, and they could leverage this technology and e-commerce. However, using the internet can be complex, therefore, various internet skills could be a prospective method to a better understanding of efficient internet use (Alam et al., 2022; Singh Dubey et al., 2022; Saba et al., 2021).

Operational skills, is also known as simple skills for using the internet such as browsing and searching (Van Deursen et al., 2021). This is considered the most basic form of using the internet (Van Laar et al., 2020; Mota & Cilento, 2020). Formal skills are associated with precise internet structures, assisting users to perform activities with ease (Singh Dubey et al., 2022). Operational skills and formal skills are dependent on the device being used

(Correa et al., 2020; Van Laar et al., 2020). Information skills are the skills used for searching, selecting, and accessing information on the net (Van Laar et al., 2020; Mota & Cilento, 2020; Correa et al., 2020). Strategic skills are skills used to achieve professional goals by using the internet and they are the most high-level skill. Strategic skill sets goals to be achieved using technology, and executes the activities by acquiring, joining, and using the information (Correa et al., 2020). This type of skill is required for the usage of e-commerce via the internet.

People have different stages of internet knowledge and skills that are based on demographics, personalities, experience, and activities (Singh Dubey et al., 2022). According to Mota and Cilento (2020), SMEs with good digital skills incline to participate in more online operations such as e-commerce, therefore positively influencing the growth of e-commerce, whereas SME owners with lower skills will use the internet for entertainment rather than professional activities (Saba et al., 2021).

The broadband technology has been in the foreground of the Covid-19 pandemic transformational ascent (Berners-Lee, 2020). It is personified as a driving force of a positive revolution in the SME e-commerce industry and the future of digitisation (Mora, 2021). It is essential to ensure that everyone has basic skills and access to the benefits of broadband, so that consumers support SMEs that operate via online platforms (Berners-Lee, 2020). Businesses and consumers need access to the limitless benefits and power of broadband technologies to create an enriched economy for the world (Oughton et al., 2021; Berners-Lee, 2020).

After having access to reliable broadband and the skills that support internet usage, the next element of the e-commerce process is the e-shop platform of products and services (Semerádová & Weinlich, 2022). This step of the process is also fundamental for the success of an e-commerce business and the issues experienced among SMEs through the Covid-19 pandemic are discussed next.

2.5.2. E-shop platform

The features of an e-shop platform are extremely critical in attracting and maintaining a consumer base (Ingaldi & Ulewicz, 2019). This forms a critical role in the e-commerce process and without an effective and efficient platform, SMEs will not be successful (Ingaldi & Ulewicz, 2019). However, during the Covid-19 crisis, when people were forced to significantly limit physical interactions and had strict confinement measures, SMEs were

forced to operate using an e-shop platform to sell their products (Dvořák et al., 2021). If the business did not possess the agility to adapt fast enough, the business either shut down or closed temporarily (Dvořák et al., 2021).

Globally, e-commerce is known to be the goliath industry (Gokila, 2021). Trends have frequently fluctuated to outline the way individuals around the globe purchase products. Developing nations like Brazil, Russia, India, China and South Africa (BRICS) are anticipated to contribute a colossal role in the future of e-commerce (Gusarova et al., 2021). It was projected that approximately three billion purchasers from the BRICS nations would obtain access to the internet by 2022, and 20% of all retail sales would be from consumers that live in those nations (Gusarova et al., 2021).

It was evident that SMEs did not sufficiently invest in the e-shop platform strategy (Xu et al., 2020; Raval & Bhatt, 2021; Pentz et al., 2020). Research revealed that e-shoppers were attracted to an online store's visual appeal. Li et al. (2021) further suggested that the quality of images used to represent the products and services offered could decide the success of an e-shop. Additionally, due to the pandemic and the enforced lockdown regulations, online customers chose to thoroughly examine the product or service much like they would in a physical store (Jiang & Stylos, 2021). Therefore, having eye-catching images and videos was essential for e-commerce enterprises to encourage customers to make purchases and thereby enhance revenue (Wei & Zhang, 2021). Semerádová and Weinlich (2020) argued that e-commerce SMEs would need to develop their videography skills because videos are projected to have a pivotal role in the development of the e-commerce industry as 60% of consumers would rather watch a product video than read the description. Additionally, 64% of customers finalise the order to purchase after watching the evolution of social media applications like Facebook and Instagram which prioritise video content updates (Semerádová & Weinlich, 2020).

Many South Africans have preferred the old-fashioned brick-and-mortar stores (Mofokeng, 2021). Therefore, when the Covid-19 pandemic arose, e-commerce was considered unnecessary to SMEs (Kalidas et al., 2020). Due to this, many shops closed down and many businesses did not take into account the significance of scaling up their e-commerce website (Dean & Campbell, 2020). As the brick and mortar shops closed around the globe, e-commerce rose in popularity; it took the unclear epidemic to direct many SMEs into action (Dean & Campbell, 2020). According to Terrence Govender, a director at Mazars advisory,

“the Covid-19 pandemic accelerated the digital journey for numerous SMEs, but it also trapped several SMEs at the start of lockdown as they should have started the digital journey five years ago” (McKinsey & Company, 2020).

The Nedbank economist, Busisiwe Radebe, reported that “ a generation of South Africans will still favour brick-and-mortar stores over an e-shop platform; however, it is forecasted to change as the spending power of this Baby Boomer generation makes way for the Generations Y and Z, that do most of their shopping via the e-shop platforms” (Ramlall et al., 2020). Due to the online shopping generation set to rise, it is crucial for SMEs to have an online existence that is attractive and resilient (Gachenge, 2020).

Streamlining their e-commerce process was rare among SMEs during the Covid-19 pandemic (Salem & Nor, 2020). There were fluctuations in the need for certain products and customers that suffered financially found ways to regain money from their spending, which resulted in a rise in returns (Hwang et al., 2020; Sharma, 2020). This situation made it imperative to provide consumers with a stress-free process, allowing them to authorise the return via the e-shop platform and to track the progress online. However, this is far from what actually took place among SMEs during the pandemic (Van Laar et al., 2020) as many customers were left unsatisfied because businesses could not deal with the surge in calls and emails to customer service teams and managers (Sharma, 2020). It is thus clear that the consumer expectations should be met by the e-shop platform in order to impact a positive growth of e-commerce (AlHudaib & Al-Shammari, 2022).

Thaha et al. (2021) postulated that digital marketing strategies support the e-shop platform by utilising many techniques to attract consumers and create an easy modernised shopping experience for consumers. During the Covid-19 pandemic, SMEs were required to use this approach to implement a successful platform; however, many SMEs grappled through this time and were unsure where to start (Madurapperuma & Wijayanayake, 2021). The next section presents problems encountered with digital marketing strategies among businesses during the crisis.

2.5.2.1. Digital marketing strategies

The very rapid progress of e-commerce during the Covid-19 pandemic in this virtual era affected various aspects of life, including a change in the way business operates in the current age (Purwanto, 2022). E-commerce SMEs cannot succeed with great products alone, consumers need to be drawn to buy them and therefore proficient marketing is a

quintessential segment of the success in e-commerce. For this reason, SME owner/managers have to understand the significance of digital marketing to successfully aim at and attract appropriate customers (Behera et al., 2020).

Digital marketing is defined as achieving marketing goals by applying marketing entirely online (Thaha et al., 2021). The term digital marketing, refers to the promotion of products, services, content and ideas via digital channels such as the web, mobile phones, and electronic store displays (Kumar & Pradhan, 2018). There are no limits on the types of consumers that can be reached by digital marketing because it uses a wide range of techniques to entice and propel them to engage with these strategies online (Thaha et al., 2021; Adam et al., 2020; Ritz et al., 2019). In a similar vein, Thaha et al. (2021) concurred that digital marketing facilitates communication and is used to promote goods in a customised and economic manner. Promotion of goods and new product offers are all facilitated through the use of digital marketing strategies.

Literature revealed that use of digital marketing strategies among SMEs was investigated by the factors that drive the usage of these activities (Pandey et al., 2020). One study showed that the lack of competency of SMEs, their low levels of awareness and organisational readiness are the reasons for not effectively adopting digital marketing (Madurapperuma & Wijayanayake, 2021).

Some studies have found that SMEs are changing their marketing strategies in response to the rapid development of new technologies (Madurapperuma & Wijayanayake, 2021). The adoption of digital marketing is more probable in business if SMEs believed it would offer a profitable outcome than current methods, and if it was compatible with the business culture and IT infrastructure (Madurapperuma & Wijayanayake, 2021). However, it appears that a mismatch between supply and demand prevents SMEs from fully embracing online marketing and sales (Mohan & Ali, 2019). Many SME owners are left in the dark about the significance of using digital media for marketing and failing to recognise the possibilities it offers due to the rapid pace at which technology is evolving (Thaha et al., 2021; Kumar & Pradhan, 2018; Adam et al., 2020).

One of the biggest challenges for SMEs to implement digital marketing is the lack of resources (Ritz et al., 2019). This is due to the fact that SMEs typically lack the resources necessary to adapt to the changing nature of digital markets and the ever-evolving technology landscape (Olson et al., 2021). According to Pandey et al. (2020), the IT

competency and skills of SMEs is the primary factor in determining the success of their digital marketing campaigns. Many researchers have argued that proprietorship of digital marketing capabilities and resources supports the e-shop platform and the growth of e-commerce (Phiri, 2020). For this reason, the manufacturing industry was recommended to use IT skills which permit digital marketing, which includes adaptable manufacturing and content management abilities.

Some SMEs use digital marketing as a tool to gain profitability by cultivating interaction with channels of the e-shop platform and various markets for the growth of e-commerce (Behera et al., 2020). Thus, by utilising digital marketing strategies, SMEs can gain entrance to contemporary markets collectively through better interaction with consumers and improving competitiveness with evolving developments of new markets (Peter & Dalla Vecchia, 2021). Nuseir and Aljumah (2020) discussed the involvement of using digital marketing to benefit the e-shop platform in many ways such as: economic pricing, targeting a larger population at the same time, offering goods in a convenient way, allowing consumers to have enough product information to influence decisions of purchase.

One of the most important aspects of any business, is online communication and it differs greatly from more conventional forms of advertising (Saura et al., 2021). Ratnasingam et al. (2021) reported that SMEs can benefit from a technological structure and web service made possible by online communication. Businesses rely heavily on e-commerce sites to spread the information about their products, build relationships with customers, and reach a massive audience all at once, and in turn increasing the growth of e-commerce (Gauli, 2021; Ratnasingam et al., 2021). According to literature, SMEs benefit from the e-shop platform because it forces them to strike a delicate balance between various primacies and contributes to a positive influence towards innovative marketing strategies (Ritz et al., 2019; Madurapperuma & Wijayanayake, 2021).

As consumers have become more familiar with browsing and purchasing from their mobile devices, SMEs need to adapt and optimise their websites with marketing campaigns for mobile as well (Pantelimon et al., 2020). Content marketing has been forecasted to capture the attention of the audience with 78% of consumers who claimed that relevant content rises the intention to purchase (Geng et al., 2020). Certain digital marketing strategies have developed algorithms to monitor the tastes and behaviour of a consumer. This strategy assists SMEs to ensure that the marketing campaigns are frequently optimised and are likely to

reveal products that the SME e-commerce business believes the consumer is likely to buy (Jayadeva, 2022).

Augmented reality is a new technology recently introduced to marketing strategies whereby consumers can see what they are shopping for and this assists in purchasing decisions (Qin et al., 2021). It creates a near reality shopping experience and shoppers can make decisions without physically touching the product (Tan et al., 2022). This marketing strategy is more common in fashion and home décor. Thirty-five percent of individuals revealed that they would be using e-commerce platforms much more if they could virtually try on the product prior to purchase (Rauschnabel et al., 2022; Tan et al., 2022). However, SMEs in South Africa and other developing countries are far from utilising this technique (Rauschnabel et al., 2022; Alam et al., 2021). Chatbots is another digital marketing tool that is commonly used among the larger enterprises. It provides consumer support; however, many consumers are not fond of using this tool to assist their purchase (Mokhtar & Salimon, 2022).

According to Gauli (2021), businesses that leapt on the social media movement, particularly those in retail, saw huge increases in their visibility. Malesev and Cherry (2021) inferred that since social media is designed to connect to so many different people, it is a useful tool for reaching a larger number of potential customers. Saura et al. (2021) suggested innovative approaches to advertising, that would assist SMEs to increase sales and profits through channels like the internet. Nuseir and Aljumah (2020) also offered a comprehensive evaluation of the advantages digital marketing could provide SMEs, for example adaptable interaction and optimistic monetary growth.

Thaha et al. (2021) did a field report to offer businesses with an understanding towards prominence of digital marketing and the various channels to benefit SMEs. Additionally, (Olson et al., 2021) found that joining in high-level social media activities allows SME owners/managers the prospect to implement tactics and inventive advertising methods to continue to be aggressive among competitors.

Despite the prevalence of social media in the retail sector, numerous company executives did not to comprehend the idea (Hu & Olivieri, 2021); and some SMEs were not equipped to secure consumers to participate in social media e-commerce (Ratnasingam et al., 2021). In contrast, the assimilation of social media by some SMES has positively impacted their business by growing traffic on their e-shop platforms, creating consumer awareness, and total revenues (Baharuddin et al., 2022). Joseph et al. (2020) conducted research about SMEs

that used social media marketing to flourish their firm. The findings were that digital marketing is a perplexing platform; nonetheless, the digital technology increased communication with consumers while providing trade of goods (Gauli, 2021; Joseph et al., 2020). It is thus vital for SMEs to know that with social media marketing they partake in a world-wide landscape surrounded with competitive prominence, discount of products, involvement of employees, creating strong supplier and consumer relations, and marketing goods (Baharuddin et al., 2022).

Contrary, Salem and Nor (2020) noticed disadvantages with SMEs' digital marketing strategies, like dearth of trustworthiness, absence of customer confidence, and lack of understanding. Salem and Nor (2020) concluded and confirmed that the difficulties would decline as SMEs develop integrity with purchasers.

The main reason for supporting the e-shop platform with digital marketing strategies is that SME processes are advancing very fast (Tavlaridou, 2020). Consumer behaviour is changing consistently, and utilising digital marketing helps adapt to those changes (Tinelekoglou, 2020). It is also the only medium to support the e-shop platform and positively impact the growth of e-commerce among SMEs, particularly through a pandemic (Thaha et al., 2021). Further, the growth of smartphones and the internet also provide widespread access to selling and buying merchandise at ease (Ilgaz Sümer, 2020).

It has been highlighted in a research study by Chamboko-Mpotaringa and Tichaawa (2021) that using digital marketing in the e-shop platform created a large turnover in SMEs as it assisted in acquiring new customers and brand awareness. In South Africa, during the Covid-19 pandemic, consumers were found to be very particular about content and reviews of the product on all platforms before a purchase (Mofokeng, 2021).

According to an analysis by CM Commerce (Wong, 2020), 37 million social media visits led to approximately 529000 orders. Facebook assists in averaging 85% sales. Consumers reportedly get distracted easily, therefore, digital marketing attracts the consumer and helps navigate them through this challenge, boosting sales for SMEs taking advantage of these digital marketing strategies (Mustaphi, 2020).

There are many digital marketing channels that SMEs utilise to make their e-shop an ease, such as SEO (Matta et al., 2020; Panchal et al., 2021; Perbangsa, 2021). This digital marketing channel could be used to support the e-shop platform which promotes the growth of e-commerce for SMEs (Matta et al., 2020). Additionally, it could increase the quality and

quantity of traffic to the e-shop through organic search engine results (Nuseir & Aljumah, 2020; Baharuddin et al., 2022).

Search engine marketing is the digital marketing channel that improves the visibility of the e-shop by increasing the search engine ranking. The search engine marketing uses funded promotions to spread the advertisement to those consumers in search of the product or service (Angeloni & Rossi, 2021). Panchal et al. (2021) suggested that the most common platform used by search engine marketing is the Google Ad Words and SMEs operating via an e-commerce platform should concentrate on using it.

The email marketing channel strategy contributes to a better shopping experience by sending a confirmation email and a digital invoice once a purchase has been made on the e-shop platform (Kroekbodin, 2021). SMEs may use this to find out about consumers' experiences, as a reminder of abandoned shopping carts and as general information about the business (Tien et al., 2020). Personalised emails also assist the consumers to connect with the company and build relationships (De la Cruz, 2021). For example, Amazon emails campaigns as per consumer preferences and have started segmenting consumers for the email marketing campaign, and this strategy has made it simpler for them to be personal and know the consumers' interests, which has assisted in increasing the company's profitability index (Jayadeva, 2022). Amazon's email marketing strategy involves sending out welcome emails with special offers and invitations to browse the store. If a consumer has purchased anything, they send out thank you emails. This marketing strategy is extremely effective and Amazon has thus designed a blueprint for each consumer to ensure they get the best return on investment (Denga et al., 2022).

SMM is a marketing strategy that has taken the world by storm as there is hardly anyone who is not active on social media (Dubbelink et al., 2021). Through the Covid-19 pandemic, SMEs explored social media marketing as it was the cheapest, quickest and best way to market products, while everyone stayed at home (Syaifullah et al., 2021). SME owners/managers posted regularly on Facebook as it became easier to reach out to consumers through social media. Some digital markets introduced paid social media to gain even more consumers. Zappos is an online shoe store, based in Las Vegas, Nevada, US. Zappos became successful at using digital marketing strategies as they paraded their uniqueness and culture to the world (Kumar & Venkatesan, 2021). One of the strategies used is a social media Twitter account that was designated to only service problems (Qiu & Yang, 2020). The other

strategy is that all staff at Zappos must have Twitter accounts and should be cooperative with that culture prior to employment. Their Twitter accounts are used for exposing Zappos with their postings, creating a competitive advantage, which makes the SME online business real (Yohn, 2020).

The benefits of advertising on social media for both customers and businesses have been researched extensively (Mason et al., 2021). Li et al. (2021) argued that, with the development of new tools, social media marketing has become a potent tool for SMEs to advance their operations and cash in on emerging social trends. This was elaborated on by Ilgaz Sümer (2020) who argued that SMEs could also imitate virtual advertising schemes to increase a competitive advantage against other businesses and entice different associates.

According to Redjeki and Affandi (2021), digital marketing relies deeply on business creativeness and the efficiency of the advertising tools. Consumers' confidence in e-markets, digital marketing, beneficial marketing materials, and satisfied customers all play a role in the thriving online retail industry (Nhuvira & Dorasamy, 2021; Verma et al., 2016).

Social media marketing creates limitless opportunities (Ilgaz Sümer, 2020). Malesev and Cherry (2021) also noted that social media content could appeal to purchasers, therefore increasing sales volumes and advancing the perception of SMEs. Conclusively, digital advertising is a prime display of the growth of e-commerce and e-shop usage should increase concurrently with the amount of internet end-users (Pollak & Konecny, 2021). Margarita (2021) demonstrated this in statistical results and confirmed that virtual marketing for a modicum of six hours weekly generated more than triple consumers compared to traditional marketing.

Abraham et al. (2021) argued that trust in an e-shop retailer guides shoppers to believe that their personal information is secure which in turn has increased purchase choices. Svobodová and Rajchlová (2020) indicated that e-shop platform settings demand excellent features which outline a consumer's retail experience and determine possibilities of consumer's acquisitions in the future. Therefore, a satisfying consumer experience is a vital method to support customer relationships.

Mobile retailing is a rising force in the retail industry by providing customers with faster connections, greater accessibility and more convenient shopping experience (Li et al., 2020). In addition, mobile retailing is an accelerated service eradicating extended wait times for in-store and computer access (Correa et al., 2020). Such electronic retailing offers SMEs a

platform of technological material to utilise as an aggressive marketing defence, particularly during a pandemic (Singh, Gupta et al., 2021). Therefore, Galhotra and Dewan (2020) postulated that generating an online presence on social media such as Facebook and Instagram, should raise sales prospects for SMEs to enlarge social capital during a pandemic.

According to Farajnezhad et al. (2021), based on the Rogers diffusion innovation theory, SMEs have expended digital content to connect with consumers, distributing information, generating awareness of brands, and developing affiliations. Geng et al. (2020) articulated that when SME owners/managers share information online, it enhances their professional character and eminence in the online society. Al-Gasawneh and Al-Adamat (2020) noted that a digital tool preferred by consumers during the Covid-19 pandemic was communication of information through quality photos and videos. For this reason, SME owners needed to understand that the content they displayed was a key strategy to lure customers.

During the Covid-19 pandemic, several SME owner/managers were aware of information being distributed about utilising social media (Salam, Imtiaz et al., 2021). This included the influence and threats confronted by using the platforms. SME managers became more conscious of their expenses, and in catastrophic conditions, many SMEs adopted free social media marketing platforms (Khamaludin et al., 2022).

Since working from home meant that SMEs could no longer sell their products directly to consumers (Gokila, 2021), they began to determine which would be the cheapest internet technology to adopt and social media was considered to have more benefits than offline marketing (Ilgaz Sümer, 2020). Farajnezhad et al. (2021) argued that the Rogers diffusion innovation theory implied that SMEs perceived superiority in utilising digital marketing and this made it simple for them to adopt the technology. This assertion was also supported by Chandra and Kumar (2018).

Complexity of adopting digital marketing also plays a crucial role in e-commerce. If it is relatively easy to learn and not challenging to adopt, the SME owners/managers are willing to participate (Perbangsa, 2021). During the Covid-19 pandemic, SME owners/managers realised the benefits of online applications. Perbangsa (2021) posited that compatibility could enable SMEs to implement information technology and that skills of staff were one of the key factors that can influence adoption. Perbangsa (2021) also revealed that the capability to operate with information technology impacts the rate of adoption in SMEs.

During the Covid-19 pandemic, SME owners/managers tried to work collectively with employees to build an online marketing infrastructure. The SME managers became more aware of digital marketing by acquainting themselves with social media as a resource for marketing (Ilgaz Sümer, 2020). The Covid-19 pandemic also caused changes in SME traditional marketing (Ratnasingam et al., 2021). Many SMEs experienced a rapid decline in turnover. Due to the fast decrease in sales, SME managers became aware of the presence of social media marketing (Ilgaz Sümer, 2020), and those who advertised through social media realised an escalation in their competitive advantage (Redjeki & Affandi, 2021).

The e-shop platform cannot blossom alone (Abraham et al., 2021). Digital marketing strategies can assist SMEs to develop consumer traffic on their e-business website and increase sales (Darma & Noviana, 2020).

After attracting consumers to the business's e-shop platform via digital marketing strategies, the consumer then chooses the product/s and reaches the payment portal (Zuyeva et al., 2020). This is the section that closes the deal. Many SMEs, especially during the pandemic, had major concerns adopting and utilising this tool from a business perspective. Next, digital payments during the Covid-19 pandemic are assessed and conclusions provided on how they influence the growth of e-commerce.

2.5.3. Digital payments

As previously stated, globally, the Covid-19 outbreak evolved into a pandemic and people stayed at home to curb the spread of the virus (Toh & Tran, 2020). Governments implemented restrictions that limited social contact. These restrictions resulted in a surge of e-commerce, which extended to categories such as groceries (Toh & Tran, 2020). The efforts to diminish physical contact and the touching of cash, also triggered an increase in contactless payments (Toh & Tran, 2020). The payment systems market is undertaking new digital technology. The e-commerce trends have created new digital payment solutions that are contributing to the advent of a cashless society (Allam, 2020).

China was the most impacted by the Covid-19 virus, and fresh food sales on JD.com leaped to 215% in a period of ten days in February 2020. Many challenges were accounted by SMEs with transitioning payments digitally (Ani, 2020). The entire world needed to check their carts out and most consumers were left stifled (Shree et al., 2021). The younger generation were somewhat less concerned regarding digital payments as they are reshaping the digital landscape and are more prone to shop and pay with their mobile phones (Wei et al., 2021).

The payment situation significantly impacted South Africa during the Covid-19 pandemic as many SMEs didn't have enough payment options for consumers and those without credit cards were left without being able to purchase their daily needs online (Zuyeva et al., 2020).

Several SMEs attempted adopting e-commerce in their operations; however, bank fees were a major consideration and a barrier to e-commerce, because, for SMEs, 5% of the sale was the bank fees (Tambe, 2020). Furthermore, businesses that concluded deals with global consumers encountered much higher banking fees (Klein, 2020). For example, if a business utilised PayPal, it would have suffered a loss due to the foreign exchange and additional charges levied (Mkansi, 2021). According to Ankiilu (2020), the increased banking fees had adverse effects on the growth and development of minor online merchants. The transactional banking segment of e-commerce also encountered enhanced challenges during the pandemic with the creativity of payment portals to cater to those consumers that could not obtain credit cards, the safety of data, and cybercrime (Akanfe et al., 2020, Najib & Fahma, 2020).

The emergence of Covid-19 thus made the need for digitising payments more critical than ever before and for that to be implemented successfully, electronic payments need to offer parallel advantages to consumers provided by cash (Falak et al., 2021). Globally, countries are in different phases of development to execute payments quickly and to possess the agility to adapt to the future digital economy (Ani, 2020). The initiative towards the utilisation of digital payments and reducing the dependence on cash is not a new phenomenon to the South African payment sector (De Girancourt et al., 2020). Several means are in operation to drive this and banks, together with fintechs and retailers, are working collectively to roll out contactless payment systems (Ayileka & Fagbolade, 2021). Near field communication comprises digital cards used for low amounts at the point of sale, and when the amount exceeds a certain amount, a pin code is required (Chaveesuk et al., 2022). Globally, retailers and banks responded to the fear of Covid-19 and increased the limits of the contactless digital card transactions, allowing higher amounts to be received without entering a pin and touching the terminal (Civelek et al., 2021).

Anonymity, accessibility, usability, privacy, and reliability are some of the attributes of the electronic payment system that set it apart from more conventional methods of purchasing (Gupta & Kumar, 2020). Additionally, it saves time and is cost effective. Many banks claimed to have seen an amplified uptake by SMEs with the use of the QR code. The QR code uses an application on a mobile device to scan the QR code at the business (Ani, 2020).

This safeguards the application in that no bodily contact is required which ensured convenience for the consumer during the Covid-19 pandemic (Civelek et al., 2021). Cashiers at stores had reduced touching consumer bank cards prior to Covid-19; however, during the pandemic, it became common practice due to the risk of spreading the coronavirus (Tut, 2020).

The South African Reserve Bank has an important financial inclusion goal in South Africa called Vision 2025 (Mhlanga et al., 2021). Approximately 80% of South African citizens have a bank account; however, there is still a much reliance on cash due to limited access to credit cards and insurance (De Girancourt et al., 2020).

It is known that many SMEs operate completely with cash, although their customers prefer paying by card (Khan et al., 2021). This needed to be dealt with during the pandemic when point-of-sale devices were necessary across all SME sectors to support card acceptance as many consumers preferred home call out services to prevent exposure (De Girancourt et al., 2020). New SMEs in the point-of-sale market increased, which provided devices connected to cell phones that involved lower costs for the SMEs (Ayileka & Fagbolade, 2021).

Then there are the challenger banks that are created to offer digital services (Mhlanga & Denhere, 2020). These digital challenger banks offer services at reduced costs as they do not have expenses of a branch infrastructure (De Girancourt et al., 2020). South Africa is in progress of offering a digital bank focused on financial inclusion (Mhlanga & Denhere, 2020). This digital bank will offer a retailer membership to assist their consumers and arranging booths all over the country (Ayileka & Fagbolade, 2021).

Obtaining safe and secure payment options could mean developing a biometric digital identification (ID) system; however, in South Africa, there are many challenges, such as no or underdeveloped infrastructure, internet connectivity that is not reliable, working with biometric device malfunctions, and ID duplicates (De Girancourt et al., 2020). Many occurrences of fraud have caused a lack of trust and lack of confidence in digital payment systems (Primadineska & Jannah, 2021). Other issues include server glitches, lack of understanding, fear of scams, concealed charges, lack of latest information, lack of safety, fear of losing money and complex instructions (Ayileka & Fagbolade, 2021). For these reasons, consumers feel more secure and find convenience in making payment with a bank card, as it provides a sense of control to the consumer (Siby, 2021). The range of cards offered, like the debit, credit, and prepaid cards, all offer remarkable flexibility (Siby, 2021).

Through the pandemic, various payment methods available became very useful for everyone (Salam, Saha et al., 2021). Some of the more well-known methods are internet banking and mobile banking. The internet banking, or electronic banking is an digital payment method which permits consumers that belong to that bank to perform different monetary transactions through the bank's website (Alwi, 2021). Mobile banking is a facility offered by the bank that permits consumers, including SMEs, to do financial transactions remotely by using a mobile device through a banking application. The Unified Payments Interface (Guan et al., 2020) is a system that was developed to allow an SME to have many bank accounts on one mobile application of a particular bank (Gupta & Kumar, 2020). This banking app merged all bank features to ensure a smooth movement of funds and business payments into one place (Rastogi et al., 2021). During the Covid-19 pandemic, the mobile wallet was also a method to have cash in digital format (Revathy & Balaji, 2020). Instead of using the physical plastic card to purchase items, SMEs provided the option to pay with a smartphone, or smart watch (Saraswati et al., 2021).

The Covid-19 pandemic has transformed the way business and consumers network with financial institutions, impacting the payment methods (Siby, 2021). The resurgence of broadband, digitisation, fluctuating consumer preferences and e-commerce has enhanced the interest and usage of electronic payments (Santosa et al., 2021). The increase in usage of digital payments during the pandemic reinforced the growth of e-commerce (Zuyeva et al., 2020). The blend of electronic payments and online tools means simpler access to a large consumer base throughout countries across the globe (Gupta & Kumar, 2020). Additionally, this has provided SMEs and consumers with superior convenience and choice (Civelek et al., 2021). However, even though the digital realm is hypothetically borderless, there are many challenges with e-commerce globally, which has created different boundaries in various countries such as international supply restricted and availability of electronic payment services (Wodnicka & Skurpel, 2021).

Although implementation of electronic payments developed prior to the pandemic, the Covid-19 crisis sharply shifted the desire for non-contact digital payment (Sharfuddin, 2020). Additionally, the US retailers noticed that the average shopper spent 30% extra on behalf of shopping online in the first 6 months of the year 2020 and the Philippines' digital payments increased over 5% from the start of the Covid-19 pandemic (Toh & Tran, 2020).

For some SMEs, the advent of a new digital business was met with little difficulty because they had already implemented effective electronic payment systems prior to the Covid-19 pandemic (Purba et al., 2021). Unfortunately, SMEs typically had to quickly implement new technologies and organisational procedures in order to keep operating and remain competitive (Chaveesuk et al., 2022). According to a global payment report by ACI Worldwide, nations that were prepared for the pandemic by having a resilient electronic payment system in place, experienced less economic fallout (Zuyeva et al., 2020; Darma & Noviana, 2020). National standards and many other security measures need to be taken into account by any business that wants to develop an effective digital payment strategy (Civelek et al., 2021).

Additionally, regulations concerning security of payment, privacy and financial crimes are always being updated to account for new technology. There are important financial considerations involved in implementing new electronic payment systems, particularly if the current infrastructure contains outdated technology (Ani, 2020).

Furthermore, technology is only a portion of the equation when it comes to digital payments. The usage of digital payments in businesses and consumers depends on factors like how they use money, how familiar they are with technology, and how comfortable they are with making financial transactions online. (Jiang et al., 2021). It was noted, however, that during the Covid-19 pandemic, SMEs and consumers started to accept the technology of digital payments (Zuyeva et al., 2020).

One area of potential concern that has not received much customer courtesy, is privacy (Ani, 2020). Online purchases can be easily monitored by all parties involved in the transaction (Toh & Tran, 2020). The personal data is shared with other parties for profiling and other marketing uses (Darma & Noviana, 2020). The director at the Consumer Federation of America, Susan Grant, who deals with consumer protection and data privacy, stated, “It’s just a mind-boggling tangle of information sharing that’s going on out there those consumers have no idea is happening”.

Modern SMEs adopting e-commerce in their operations now participate at a regional and global level, and these leading participants obtain greater than 50% of their revenue external the local nation (Sharfuddin, 2020). While globalisation and contemporary technologies have created astonishing new prospects for the growth of e-commerce, SMEs contemplating to operate across the border could experience complexity and resource-intensiveness (Wodnicka

& Skurpel, 2021). For many SMEs growing their e-commerce business, adjusting to restricted payment structures and consumer payment preferences has proven to be challenging (Shree et al., 2021; Chaveesuk et al., 2022). Local payment methods allow SMEs to reach unreachable markets, however, they also add a great deal of complexity to the payment process (Siby, 2021). However, Jiang et al. (2021) reported that SMEs could source a global interacted payment associate that deals with hassle-free entry to most local payment techniques, with preference to a solitary combination for most geographic marketplaces.

Once a consumer reaches the payment page, their journey has only begun (Primadineska & Jannah, 2021). For merchants, the payment process has evolved from a mere formality to a chance to connect with customers and improve their overall shopping experience (Zuyeva et al., 2020). Convenience for customers was a moving target, but new developments in technology have resulted in consistently varied demands from shoppers and SMEs are required to balance the customer's request for a smooth experience in the demand for payment safety and fraud protection. Therefore, Jiang et al. (2021) recommended that SMEs could ensure that the payment service provider offers the right technology to ensure a rapid and cost-effective placement that advances the shopper experience, together with eluding any excessive threats. The contemporary technology should be incorporated in the current infrastructure.

Reasonable profitability remains a continuous issue among e-commerce retailers (Zuyeva et al., 2020). During the Covid-19 pandemic, even though all trends reveal subsequent domination of e-commerce, the necessity to participate in digital revolution, together with new opponents with diverse operational and price prototypes, created an impeccable storm for merchants (Dvořák et al., 2021). Collectively, the threat of fraud, expensive charges and disputes, and a complex settlement process meant there was no absence of burden on SME profits. Civelek et al. (2021) noted that even a perfect payment setup cannot resolve the profitability disputes among SMEs. The payment service provider should provide a system to detect and prevent fraudulent transactions, an easy way to file chargebacks and resolve disputes across all payment types and streamlined reconciliation services.

The payment landscape, industry participants, and consumer expectations in each country are all different, however, with the expansion of electronic payment systems and international trade, businesses today are increasingly global (Wodnicka & Skurpel, 2021). Digital payments were crucial in the retail industry during the Covid-19 pandemic across the globe (Mhlanga & Denhere, 2020; Alwi, 2021). Thailand experienced a phenomenal growth

in digital payments and that led to financial inclusion among businesses in the retail industry (Rastogi et al., 2021; Alwi, 2021). The increased growth of digital payments in Thailand resulted from the increase in development of the e-commerce market.

One of the most prevalent problems confronted by businesses utilising digital payments, even prior to Covid-19, is cybercrime and the pandemic exacerbated this problem into new mind-blowing heights (Khweiled et al., 2021). This issue hindered the growth of e-commerce among many SMEs, causing further concerns of trust (Al-Azzawi et al., 2021; Abraham et al., 2021; Primadineska & Jannah, 2021). The literature points out the importance of managing cybercrime in SMEs to encourage consumers to utilise digital payments, to positively impact the growth of e-commerce.

2.5.3.1. Cybercrime management

Globally, payment portal companies are continually developing tools for recognising fraud and cybercrime, which during the Covid-19 pandemic when digital payments became the most common way to pay for goods took to a whole new level, impacting businesses and consumers (Wewege et al., 2020; Pentz et al., 2020; Mofokeng, 2021). Criminals upgraded their skills parallel to the innovative approaches designed to mitigate fraud (Kurshan & Shen, 2020). This problem was exacerbated during Covid-19 due to the large number of new consumers using e-commerce, and therefore, it became more difficult to identify suspicious transactions (Ma & McKinnon, 2021). The number of internet users in South Africa has increased drastically from 2018 with 48.35% until 2023 at 82.02% (Statista, 2023b). This was due to the shift on online usage due to the Covid-19 pandemic, as e-commerce became a commonplace for many businesses globally (Statista, 2023b). In 2020, 90% of consumers tried at least one emerging payment type, with two thirds of them doing it for the first time, and they revealed that they would not have attempted this had it not been for the Covid-19 pandemic. Threats over cybercrime became more of a growing concern as people were forced to turn to digital payments (Ahmad, 2020).

SMEs face additional challenges with cybercrime when payment was made digitally due to the rapid uncertainty brought on by the variability in consumer behaviour, interests, government regulations and economic expectation (Khweiled et al., 2021). Moreover, the state of uncertainty persisted for a long period creating a stronger need for criminals to pursue cybercrime as a method of income (Minnaar, 2020). SMEs being in an unfamiliar environment made it arduous to estimate the forthcoming fraudulent activities (Chigada &

Madzinga, 2021). Covid-19 imposed severe challenges on SMEs, and consumers' shifting purchasing habits meant that those businesses had to adapt quickly to survive. As a result, many companies have had to scrap their annual goals and overhaul their entire business model, which had repercussions for their suppliers and service providers, including payment processors and managing cybercrime (Ncubukezi, 2022).

Minnaar (2020) insisted that the paramount way to accomplish victory with combatting cybercrime and scams was by safeguarding all companies by developing efficient controls such as access to data, security of physical possessions such as personal computers and actions to inhibit unofficial access to the SMEs' computer network and system. Trawnih et al. (2021) stressed that any business possessing consumer personal data or payment card information must guarantee that the data is completely safeguarded to continue to be compliant with standards and circumvent the danger of a detrimental violation.

The Covid-19 pandemic generated a fruitful setting for cybercriminals to proliferate their interest by exploiting the pressure of the growing online community (Ahmad, 2020). Additionally, there were 61100 grievances of digital payments scams received by the Indian government in one month and over 80000 fraud cases that were worth 200 million, committed through Unified Payment Interface (UPI) every month in year 2022 (Narang, 2022). As the density of cybercrime have merged, several SMEs acknowledged the mounting issues that cybercrime caused, however, they scuffle to enforce pre-emptive and suitable safety tactics to shield their business from the cyber threats (Dalpini, 2021). The implementation of chip technology in Visa cards, had an important part in influencing cybercriminals in the direction of e-commerce platforms and due to the records of transactions are not kept secure, it is easy to be replicated (Dalpini, 2021). There is a crucial need for e-commerce retailers to ensure security best practices and guidelines applying e-commerce apps and payment software (Ahmad, 2020). Internet applications pose a large threat to e-commerce retailers as they enable payment processes with personal information from their cards and have developed into the leading cause of data violations in the retail industry (Verizon, 2020). SMEs that practice e-commerce, magnetises a rising amount of responsiveness from cybercriminals with financial motivation, with 62% of strikes in 2019 that concentrated on poor e-commerce infrastructure, pushing it up to the second most attacked sector of the global economy (FBI, 2020). Therefore, SMEs need to invest in safe e-commerce infrastructure, to manage the payment portals effectively and increase e-commerce sales.

The cybercrime system is advanced and miscellaneous, as it emulates the qualities that are discovered in lawful e-commerce platforms (Nabiebu & Akpanke, 2021). Payment and identity fraud are liable for a notable quantity of fraud losses experienced by e-commerce retailers (FBI, 2020). There are different types of cybercrime threats in e-commerce, such as phishing, malware, business email compromise, ransomware, digital skimming, credential-based attacks, and enumeration and testing attacks. Malware is a software that is meant to create damage to systems (Verizon, 2020). Roughly 94% of malware is sent via emails, and phishing attacks account for 80% of cybercrime reports (Fruhlinger, 2020). Therefore, e-commerce retailers are susceptible to all these threats and especially exacerbated during a pandemic (Dalpini, 2021). Cybercrime is therefore deliberated as a protuberant threat to digital payments and the cybercrime threats multiply as one of the most prevalent systemic dangers to the global economy, creating a destructive impact on businesses (ETBFSI.com, 2022). Consequently, research should be conducted for e-commerce retailers to develop dynamic capabilities which will create visibility, vigilance, and the tools needed to manage the cybercrime plus flourish in their business.

After making payment digitally, the goods are required to be transported to the consumer (Montoya-Torres et al., 2021). All sectors and industries are connected through supply chains and logistics (Joshi & Sharma, 2022). The Covid-19 pandemic suspended most transportation and this disrupted all supply chains (Montoya-Torres et al., 2021). The disrupted supply chains caused loss of income, together with unfulfilled orders (Mangano et al., 2022). The next section evaluates the impact of Covid-19 on e-commerce logistics used by SMEs and the affect it had on the growth of e-commerce.

2.5.4. Logistics

Logistics is one of the key areas of e-commerce (Zennaro et al., 2022). This is the final step of the e-commerce process and successful execution of the fulfilment of order leads to the growth of e-commerce (Tsang et al., 2021). However, it is not only about the delivery of shipments, but also several other processes related to customer service and warehousing (Wang et al., 2020). The e-commerce logistics is compelled by trends such as logistics co-operation models, diverse distribution techniques and cross-border e-commerce (Pawar et al., 2021).

Globally and nationally, the birth of Covid-19 induced a surge in shopping online and many SMEs revealed their non-existent resilience (UNCTAD, 2020; Lestari et al., 2021; Beckers

et al., 2021). Businesses around the globe had to change the way they operated (Galhotra & Dewan, 2020). The global outbreak manipulated the regular lives of people in this world and changed their buying behaviour quickly, which most SMEs were not equipped for enduring (Lestari et al., 2021; Salem & Nor, 2020). To restrain the increase of the coronavirus, everyone had to stay at home. Many people began spending online in new categories, such as commodities (Gokila, 2021). It represented a key, unanticipated encumbrance for SMEs that operated digitally and traded daily commodities.

In the midst of the global pandemic, the supply chain of many businesses was immensely disrupted by lockdown regulations (Butt, 2021; Rukasha et al., 2021). Many businesses ended operations, and this had a direct impact on the delivery of products and services (Chowdhury et al., 2021). Logistics companies and logistics departments were highly pressurised and overwhelmed with the workload as all consumers were forced to shop online (Sudan & Taggar, 2021).

The lockdown resulted in a crash of the economy and loss of work for many (Witkowski et al., 2020). The entire basic needs of people had to be satisfied by the e-commerce industry (Gupta et al., 2022). Due to the collapse of traditional retail outlets, the online shopping industry was under intense pressure of sharing global sales (Gusarova et al., 2021). Stoppages occurred in the transportation of raw materials, the production process, and the shipment of finished goods (Tolstoy et al., 2021; Wang et al., 2020). Some SMEs could not store abundant stock for the period of the pandemic, which disrupted the supply chain of businesses (Camilleri, 2021). E-commerce endured the pressure of supplying and distributing the products (Kawa & Światowiec-Szczpańska, 2021). The most challenging part of e-commerce during the pandemic was the issue around logistics (Vasić et al., 2021). The Covid-19 pandemic steered an increase in requirements for particular goods, and interrupted supply chains with shipping constraints and business terminations (Wang et al., 2020).

SME retailers transformed certain premises into dark stores, which was basically closing the store to community and changing it to fulfilment centres, in order to recover the dispatch times of online orders (Mangano et al., 2022). Local merchants adopted a crossbreed methodology to the business model and offered a “click and collect” option, with the intention to alleviate the difficulty on the overwhelmed logistics (Sudan & Taggar, 2021).

However, this solution was observed with the large brands and enterprises. Several SMEs were not agile enough to adapt and use these alternate methods (Mangano et al., 2022).

During the pandemic, e-shops that were small or large, were challenged with consequences of the supply chain constrictions (Thilmany et al., 2021). Due to lockdown parameters, the production in China reduced or completely stopped (Guan et al., 2020). Products that were already manufactured also had to wait for shipment (Sharma et al., 2020).

The availability of warehouse or storeroom space became a major challenge amongst SMEs as there were goods that barely moved, due to change of shopper requirements during the pandemic, and containers with new stock were stuck at the port (Thilmany et al., 2021; Guan et al., 2020).

Joshi and Sharma (2022) postulated that the SME supply chain strategy is a determinant of whether the target in offering quality products at a low cost and greater margins will reach its optimal potential.

As depicted in Figure 2.12, the framework implemented by SMEs could determine the victory or collapse of the business, as each segment is of great importance.

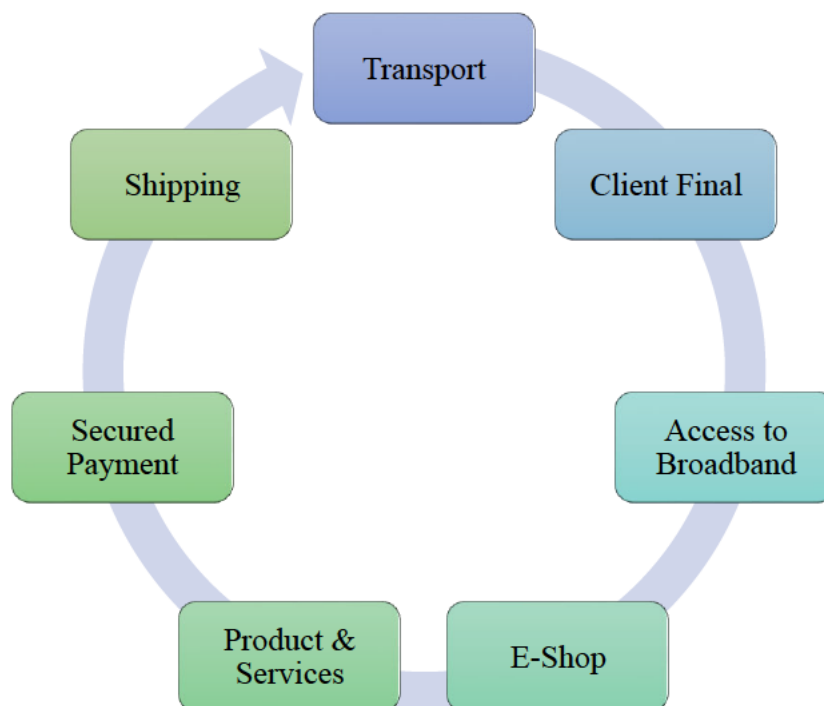


Figure 2.12: E-commerce and supply chain

Source: Adapted from Business2community.com, 2020

A total of 73% of e-commerce buyers expected cheap and rapid delivery and it became clear that if e-commerce SME retailers provided reduced shipping costs and efficient delivery service, they would preserve consumers and increase profitability (Rahman, 2022). Vasić et al. (2021) proposed that optimising shipping and delivery products by splitting the SME inventory throughout warehouses central to consumers could help with the cost and speed of delivery; however, not all SMEs are suitable for that technique. All SME e-commerce retailers should have aimed to meet consumer needs through the pandemic by reducing human errors, improving satisfaction and boosting revenue (Li & Zhang, 2020).

The Covid-19 pandemic increased the shift to e-commerce stores, causing a rise in warehouse space investment (Srinivas & Marathe, 2021). Quiroz-Flores et al. (2022) mentioned that the e-shop sales could account for up to one third of all retail trades as SMEs begin to embrace the hybrid retail operations; therefore, the rise in demand for warehouse space could be unavoidable. Additionally, the skills and knowledge to be able to maximise warehouse volume, according to the unique business model, will be essential for e-commerce SMEs (Van Laar et al., 2020). Singh, Kumar et al. (2021) posited that it is also essential to take into consideration the financial, safety and technical risks of laying out the warehouse plan.

Finne (2022) argued that third-party logistics could be the solution for SMEs and the challenges faced during the Covid-19 pandemic with logistics. Ninety-seven percent of 3PL report affirmative results with companies that utilise this; however, it is mainly among SMEs that have working capital and are able to form a partnership with the 3PL firm. Many SME owners/managers do not see the benefit of this feature and do not invest in or utilise these options available to them (Reardon et al., 2021). The greatest target for supply chain strategies was to escalate the sustainability of the business and use these benefits for the company and the consumer (Montoya-Torres et al., 2021). The 3PL has the capabilities to detect the gaps in the company's supply chain and offer solutions in every category of the supply chain such as the inventory, warehousing, order fulfilment and transport challenges (Aggarwal, 2019). It also offers expert knowledge and resources to streamline the supply chain according to the unique business model.

Figure 2.13 depicts a summary of some of the challenges with logistics among SMEs during the pandemic.

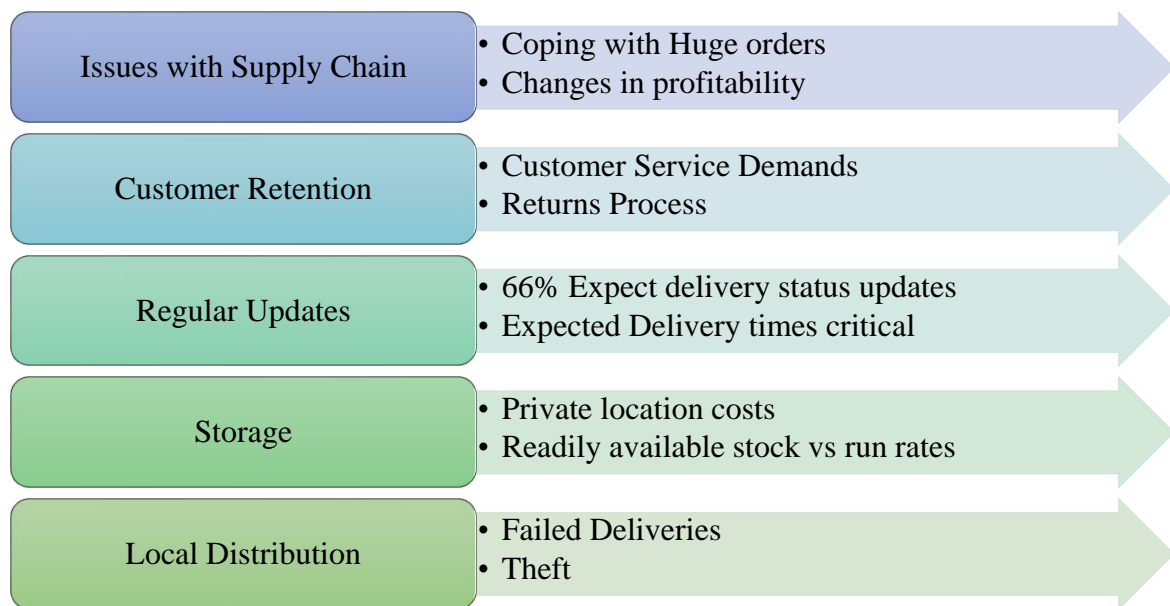


Figure 2.13: SMEs' logistical challenges

Source: Adapted from VSL Worldwide Logistics, 2020

The Covid-19 pandemic caused a resurgence of e-commerce globally and contributed to a fluctuation in demand for different products (Singh, Kumar et al., 2021). The e-commerce sales in Italy increased by 81% in one week (Lund et al., 2020). McKinsey forecasted 55% of shoppers from China could remain to shop digitally even though lockdown regulations are eased (Lund et al., 2020). SMEs that tried to weather the storm used omni-channel inventory strategies that revolved around a buy online, pick up in store model (BOPIS), and SME food retailers converted their websites to point-of-sale and transformed themselves to the delivery operation (Baral et al., 2021).

The on-the-go retail approach presented logistics hurdles (Witkowski et al., 2020). E-commerce demands efficient and effective fulfilment, and delivery that is economical for the customers (Sudan & Taggar, 2021). Among the resolutions are additional warehousing closer to consumer destination, alteration of shops to storage and fulfilment hubs, or strategic use of ocean freight as floating storage through careful timing of orders and deliveries (Peterson & Gonzalez, 2022).

Further, the Covid-19 crisis posed geographical risk in supply chains; however, it also provided the chance to re-assess supply chain sites (Montoya-Torres et al., 2021; Guan et al., 2020). When Covid-19 started, China closed down production and some US fashion merchants reported that more than 70% of goods was sourced from there. There were delays for electronic devices of up to ten weeks on shipments (Guan et al., 2020). Many SMEs

found it difficult to source other suppliers as the supply chain in China is highly efficient coupled with the large mass of highly skilled labour they hold (Guan et al., 2020; Montoya-Torres et al., 2021). Chinese production was too intensely incorporated with the contribution to other Asian markets, as it was a main source of material for clothes producers in that area and therefore difficult for the product to be sourced elsewhere (Mangano et al., 2022).

Inventory management during the Covid-19 pandemic ended up in chaos as the crisis caused a bullwhip effect as a result of the consumer demand that rippled through the supply chain (Zighan, 2021). This was a supply network phenomenon in which the inaccurate forecast quickly turned into a supply chain inefficiency. This was considered the bullwhip effect, which referred to the increased fluctuations in stock in reaction to changes in consumer requirements. For example, with the demand for toilet paper the shops were out of stock in one week, then in surplus the next week (Montoya-Torres et al., 2021; Sudan & Taggar, 2021; Musana et al., 2020).

In the dawn of the global pandemic, the images of empty shop shelves triggered panic buying, and hoarding (Singh, Kumar et al., 2021). Many supply chain leaders were presented with the gargantuan costly problem of handling the bullwhip effect. When the changes in consumer panic buying occurred, the impact of the demand was amplified as it moved up the supply chain. This caused pantries, garages, freezers and shelves at home being too full causing a demand hangover in retailers and transport (Măiță et al., 2021; Thilmany et al., 2021; Singh, Kumar et al., 2021).

SME retailers that wanted to remove the bullwhip effect could have used real-time inventory and shipment information, which could have minimised the risk of disruption while moving stock at a more anticipated reliable cadence (Zighan, 2021). However, in South Africa, large enterprises and SMEs were totally unaware of how to eradicate the bullwhip effect (Chowdhury et al., 2021). Therefore, it was recommended that they educate themselves on the triggers of the bullwhip effect, to form better reliance throughout the supply chain partnerships, unite supply chain data, and obtain an understanding about partner techniques. Building connections with other supply chain associates was crucial in avoiding the bullwhip effect (Zighan, 2021).

Order fulfilment supports the logistics in e-commerce business operations (Camilleri, 2021). It is the last step in completion of the online order, and supports the logistics element (Heck, 2020). The next section assesses the review of literature and emphasises the importance of

managing the fulfilment process to support the logistics and contribute positively to the growth of e-commerce.

2.5.4.1. Logistics management

Logistics management is defined as the process that coordinates the movement and warehousing of products via business resources (Heck, 2020). The management of logistics in e-commerce is a crucial component in the online sale (Heydari et al., 2020). Dynamic capabilities possess the attributes to transform (Bii, 2018). The logistics management is a representative of dynamic capabilities as during the pandemic, the capability of having a remarkable, efficient and effective logistics management was needed to transform the business and support the e-commerce resource (Winkelhaus & Grosse, 2020). Logistics management is the backbone of every e-commerce business as it supports in streamlining the progression of transporting merchandise between points, and consists of order fulfilment, inventory and warehouse management (Chowdhury et al., 2021).

Retail was disrupted by the global spread of the Covid-19 pandemic, which prompted a surge in demand for certain product categories from online stores (Kawa & Świątowicz-Szczpańska, 2021). The buying behaviour of people altered so fast that very little order completion processes were equipped for the situation (Heck, 2020). The majority of supply chains were torn down, no availability of staff and lockdown and hygiene regulations decelerated the order fulfilment process (Camilleri, 2021).

Heck (2020) indicated that even Amazon, globally the strongest and largest fulfilment system, faced many diverse issues, which resulted in not being able to fulfil delivery in two days and two hours for groceries. The global head of supply chain advisory, Joe Dunlap, stated that "We have long known about pandemics. We didn't understand their impact on our business and didn't really do much to plan for them, I think that given the likely wave two, wave three of Covid-19 and the next pandemic, people are likely to incorporate it into their business plans for the future" (Heck, 2020).

Furthermore, the Covid-19 pandemic decreased the usage of employees in the fulfilment and distribution centres (Reardon et al., 2021; Peterson & Gonzalez, 2022). Purchasing online moved any risk of being infected by the virus away from the cashier counter to the warehouse employees in the package centres (Riadi et al., 2022; Ferretti & Das, 2021). The overall work process was staggered in this department as social distance regulations were applied, which left workstations vacant to ensure safe distance between workers (Srinivas & Marathe,

2021). Furthermore, e-commerce retailers that use fulfilment centres reduced their staff when an employee was sick or quarantined (Peterson & Gonzalez, 2022). The new changes to the fulfilment process were slowing down the final order delivery, and training new staff became very time consuming (Camilleri, 2021; Heydari et al., 2020). Additionally, some workplaces could not be occupied at all due to distance regulations causing inventory control to be inefficient (Camilleri, 2021).

Heck (2020) examined the masses of parcels that were shipped in the United States of America since February 2020 and findings showed that the order fulfilment period amplified by approximately 40%. The identical purchase, was normally fulfilled in 15.1 hours, took 21.2 hours during the lockdown stages. For large order fulfilment deliveries, the fulfilment time more than doubled from 20.1 hours to 44.4 hours in the same period (Heck, 2020).

Even the global giant, Amazon, struggled and even though they could have hired a million new people, it would not have solved anything if there was no merchandise to sell. Amazon is known to be efficient with fulfilment as they have different modes of shipping; however, the pandemic left them with no stock to sell. Amazon started working on solving this issue and they acknowledged it would be at a higher expense (Sudan & Taggar, 2021).

Research in 2018 revealed that free shipping was an important feature for consumers that use e-commerce platforms to purchase goods (Davis-Sramek et al., 2020; Mofidi et al., 2018). Statistics show that it influenced 83% of online shoppers to purchase, and shipping costs were a key element in shopping cart desertion (Wollenburg et al., 2018). In the study, 54% of participants said they had terminated a purchase order due to the elevated price of fulfilment (Wollenburg et al., 2018). The speed of delivery mattered as well, 25% stopped the orders when shipment was too slow (Wollenburg et al., 2018). During the Covid-19 crisis, Winkelhaus and Grosse (2020) insisted that anticipated and precise fulfilment of orders would have ensured satisfied and happy consumers. A well-run and vigorous e-commerce order fulfilment could save SMEs time and money, additionally, even expand the business (Heydari et al., 2020).

The e-commerce fulfilment logistics process is illustrated in Figure 2.14, and a fruitful e-commerce fulfilment process should include numerous retailers and timetables. These should come together to operate like a smooth-running machine (Dethlefs et al., 2022). The e-commerce fulfilment is an element of logistics in the e-commerce process that delivers the product to the consumer and when the management of the logistics is inefficient, it disrupts

the entire e-commerce sale. The e-commerce fulfilment process involves four simple components, namely an e-shop platform, acceptance of goods, record of inventory management, order fulfilment, and returns processing (Davis-Sramek et al., 2020).



Figure 2.14: E-commerce fulfilment

Source: Adapted from Ship Rocket, 2020

When orders are placed, pallets of goods are shipped to the fulfilment centre, where they are received and inventoried (Camilleri, 2021). When orders come in, the pallets are pulled from storage, counted, and logged into inventory (Wollenburg et al., 2018). Many distribution centres fall short in the area of receiving. Pallets sitting at the loading dock are not selling anything as they are considered not in stock (Davis-Sramek et al., 2020).

Another merchandise business problem is shrinkage. Shrinkage is known as loss of goods in transit, stealing of inventory and breakage (Xiao et al., 2021). Most e-commerce fulfilment centres have a tolerance for shrinkage in their agreements, which ranges from 2% to 10% of the warehouse stock.

Order fulfilment occurs when the fulfilment centre picks, packs and ships the goods ready for the consumer (Camilleri, 2021). When an order arrives at the fulfilment warehouse, the employees choose the correct goods to put in the box, packs the box, then the 3PL supplier transports to the consumer. Central located fulfilment warehouses assist in shipping to the customers speedily (Heydari et al., 2020). It is essential for the logistics that goods are transported efficiently within a certain stipulated period as it may affect the consumer if the shipping time takes too long (Camilleri, 2021). Additionally, during the pandemic, with e-commerce expanding, the knowledge insertion of supply chain and logistics could produce a great advantage in the marketplace (Agrawal et al, 2020). Similarly, Chen et al. (2019), found through empirical studies that dynamic capabilities were positively linked to logistics business performance.

Figure 2.15 illustrates the three major challenges experienced with e-commerce logistics fulfilment during the pandemic.

- **Unserviceability of couriers**

On 24 March 2020, when the nationwide lockdown started, most logistics organisations became unusable for transporting non-essential items. This led to a widespread termination of operations for certain sector SMEs (Sudan & Taggar, 2021). Many packages were abandoned at courier centres or storerooms that would not be transported to the consumers (Cai & Luo, 2020). Only vital things were permitted to be dispatched, and due to the rising requirement and strict practices, couriers and merchants couldn't fulfil orders timeously (Mangano et al., 2022).

- **Restricted movement**

During the different variants and waves, many limitations were enforced on movement between borders, which impacted the supply chain. Rules and regulations were constantly changing, and it was difficult to improve operations for an extended period (Baral et al., 2021). The ramifications of the restraints were felt by SMEs as the delivery turnaround period was still extremely long for many places and e-commerce was interrupted as navigating on the correct streets for carriers had to be calculated meticulously to guarantee successful delivery (Guan et al., 2020).

- **Minimal contact supply chain**

Another encounter that SME logistics services faced was adjusting to the ruling of the crisis, which was to attain minimal contact while operating the supply chain process (Montoya-Torres et al., 2021). Prior to the Covid-19 pandemic, there were no strict regulations for sanitation and cleansing, thus, companies were slow-moving in shifting to wearing masks, gloves and disinfecting their hands frequently (Chowdhury et al., 2021). Packages received were also sterilised regularly, and interaction amongst employees and delivery needed to be reduced to a great degree (Singh, Kumar et al., 2021).

Picking and packing mistakes also contributed to a loss of consumers and profitability (Panjehfouladgaran & Lim, 2020). Returns are sometimes unavoidable, and SMEs needed to ensure they budgeted for these. Streamlining the returns was essential to e-commerce buyers, especially during the pandemic. Orji and Okwu (2021) argued that it could be a key factor in increasing sales.

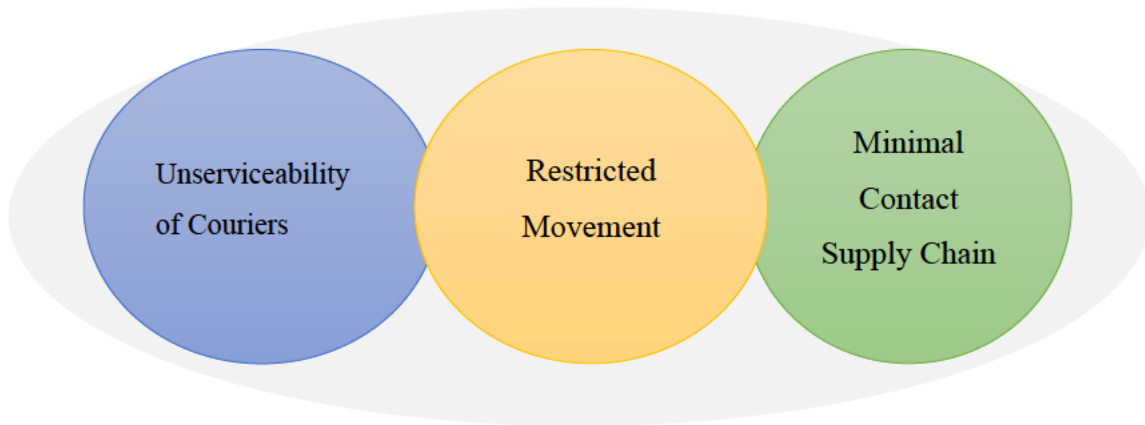


Figure 2.15: E-commerce logistics fulfilment challenges

Source: Adapted from Ship Rocket, 2020

2.5.4.2. *Reverse logistics*

Listing a return is important in the e-commerce fulfilment process as the faster it is listed, the quicker the return is processed for refunds or exchange (Pawar et al., 2021). Well-organised returns also receive the inventory back and ensure it is saleable again.

According to Orji and Okwu (2021), reverse logistics is outlined as a technique of formulation, execution and control of a skilled, economical movement of supplies, since the point of usage to the point of start. Reverse logistics denotes the return of undesirable merchandise and packaging for reusing or recycling (Wijewickrama et al., 2021). For SME e-commerce retailers, handling the returns successfully is imperative. There was a resurgence of e-commerce globally due to the Covid-19 pandemic, and most brick-and-mortar stores had to close. As the number of sales increased on the e-shop platforms, so did the returns (Orji & Okwu, 2021). Due to new e-commerce sites and new SME participants on an online platform, many SMEs were unable to fulfil the returns effectively.

SMEs around the world agreed that reverse logistics was an inconvenient challenge (Tesfaye & Kitaw, 2020). Sindhwani et al. (2022) argued that reverse logistics brought about unplanned increased costs on limited budgets of SMEs. SMEs were required to invest in innovative technology, innovative facilities, contemporary transportation methods, and to create the need for extra funds for e-commerce businesses (U-Dominic et al., 2021). SMEs' monthly budget was not enough to handle the challenge effectively (Chan et al., 2020).

The Covid-19 pandemic therefore caused a defenceless impact on SME e-commerce retailers as there were restrictions and new regulations on transport roads. E-commerce businesses had to work on alternate methods to deliver and return products (Wijewickrama et al., 2021).

During the Covid-19 pandemic, products had to be collected and handled with safety precautions (Heck, 2020). This became a major challenge, as isolated goods were avoided in the supply chain. Products had to be sanitised and quarantined before being delivered, which caused a major delay in delivery. Additionally, there were on-site inventory restrictions in order to comply with the lockdown guidelines. This matter generated mismanagement of the merchandise (Dethlefs et al., 2022).

As previously stated, reverse logistics of e-commerce was also affected by the Covid-19 pandemic (Kaviani et al., 2020). Ineffective returns management of e-shops can be attributed to a number of factors, including limited budgets, high costs, transportation restrictions, on-site audit restrictions, pressure from global sales, market volatility and returns forecast (Tesfaye & Kitaw, 2020). All the pressure was on e-commerce websites due to the lockdown. As the number of shipments came back, so did the number of orders. Therefore, it was necessary to learn more about and organise the returns procedure to handle this situation. Contingency planning, market volatility management, investments in technology and facilities could assist in mitigating the impact of these difficulties and pave the way to success (Ferretti & Das, 2021, Heydari et al., 2020).

Consumers' shopping habits have shifted, necessitating fundamental modifications to the retail industry as a whole, which meant that fulfilment and logistics operations saw several innovations and challenges at the start of the Covid-19 pandemic and experienced these during the various lockdown phases with regulations (Reardon et al., 2021).

As gradual normalisation began, the country experienced different waves of the pandemic, and the situation continued. Therefore, retailers and logistics companies, together with logistic associates, adjusted to the lockdown regulations and continued to move forward with managing functions in the most effective way possible (Orji & Okwu, 2021). Fulfilment of orders experienced many challenges; however, a few innovations assisted businesses to proceed in time (Wang et al., 2021).

2.6. Summary

Chapter 2 narrated the impact of e-commerce among SMEs globally and nationally, during the Covid-19 pandemic. It also had a detailed approach in comprehensively reviewing the literature available on the four elements of the e-commerce process and its sub-elements. The review led to many contributions which address the positive impact of broadband, the

e-shop features, digital payments, and logistics from an SME perspective, on the growth of e-commerce.

The rise in interest in the usage of e-commerce platforms and digitisation resulted in many journal articles on the subject. Each aspect of the e-commerce process was relatively well explored in literature; however, the Covid-19 pandemic changed every part of the way businesses operated from start to finish. It left no stone unturned. Due to this new phenomenon, the impact of e-commerce on SMEs in South Africa during the Covid-19 pandemic has not been investigated academically and therefore accentuated the need to investigate it as a serious problem.

Furthermore, very few studies explored the impact of Covid-19 on e-commerce among SMEs in other countries. Apart from that, new research directions emerge as technologies and digitising operations change. While promising solutions have been identified in previous literature, due to the pandemic being so new, those solutions no longer embrace the intricacy of the problems experienced. Moreover, even though a growing body of empirical research has addressed a few issues among SMEs utilising e-commerce through a pandemic, there is absence of a holistic approach and possible best practices on how SME owners/managers could mitigate the hurdles should another crisis occur.

Motivated by the gap in the literature regarding the impact of e-commerce during the Covid-19 pandemic among SMEs in South Africa, this study aims to fill the gap in the e-commerce literature by developing research suggestions that consider disruptions from a business perspective. Additionally, the gap in the literature points to a need of creating a synthesis of best practice to manage operations digitally among SMEs during a pandemic, without having to shut down, temporarily close or retrench staff.

To address the gap in the literature, the next chapter presents the theoretical and conceptual framework, as well as the development of the hypotheses.

CHAPTER 3:

THEORETICAL AND CONCEPTUAL FRAMEWORK

3.1. Introduction

In the preceding chapter, the e-commerce resources and capabilities were discussed according to the existing literature on the impact of Covid-19 on the growth of e-commerce among SMEs. The research material reviewed in Chapter 2 made it evident that there was a dearth of knowledge on the big picture of the e-commerce process and the influence of Covid-19 on e-commerce expansion among SMEs in South Africa.

This chapter provides an analysis of the challenges faced with the usage of e-commerce among SMEs during the pandemic, by applying the resource-based theory and dynamic capabilities theory. This chapter also introduces the synthesis created in the conceptual framework which involves the e-commerce resources, together with moderating variables which represent the business capabilities, and the influence it had on the growth of e-commerce or e-commerce performance, during the Covid-19 pandemic.

3.2. Theoretical framework

The growth of e-commerce on a global scale demonstrates that people accept it as a way of buying and selling products. To identify the elements that influence technology acceptability, numerous hypotheses have been developed in literature (Haryanti & Subriadi, 2020).

Researchers have used many different various theories to investigate technology adoption, namely, theory of reasoned action (TRA), technology acceptance model (TAM), the theory of planned behaviour (TPB), and integrated theories of technology acceptance and use (UTAUT and UTAUT2) (Haryanti & Subriadi, 2020). The theory of technology adoption has evolved as an adjustment to emerging problems. However, the Covid-19 pandemic brought a coerced situation of acceptance as citizens globally were not given a choice to accept technology, it had to be done for survival of businesses (Mora, 2021). Therefore, this study complements the Covid-19 impact on SMEs that used e-commerce and focuses on the Resource-Based Theory and Dynamic capabilities theory, which investigates the usage of resources and capabilities.

With the emergence of the internet and the subsequent worldwide spread of the Covid-19 virus, e-commerce proliferated around the globe (Saeed et al., 2020). E-commerce allows businesses and consumers to sell and buy items, anytime, using a digital payment system, and on time delivery, which creates trust (Gupta et al., 2022). Accompanying the journey of e-commerce, researchers added to delivering solutions to e-commerce challenges through various theories of e-commerce (Haryanti & Subriadi, 2020).

According to Penrose (2019), the theory of the growth of the firm was largely linked to the RBT and investigated the association between business resources and growth. It was also revealed that businesses posited as a framework that entailed of a group of resources and concluded that the growth of a business was limited by that fundamental facet of a firm. The development of RBT by Edith Penrose represented important research in the development of RBT and served in-depth theoretical underpinning for this study of business growth perspective of firm resources and capabilities. The resource-based theory assumed that different businesses have different bundles of resources and capabilities and there are some businesses within a similar industry that have greater accomplishments in tasks due to difference in resources (Barney et al., 2021). Additionally, resource inequalities among businesses could be less movable, due to scarcity and struggles in achieving or mirroring those resources and capabilities (Barney et al., 2021). The VRIO analysis is used to determine the performance and core competencies of businesses internally, which resembles valuable, rare, inimitable and organisation (Barney et al., 2021). A resource is valuable when it supports the business to take advantage of opportunities or eliminates risks in the business, a rare resource is unique and not broadly owned by the business competitors and a resource that is inimitable is difficult to imitate or not easily substitutable (Boateng, 2016). The last criterion is organisation, to determine if the business is capable of capturing the value that is generated from a resource (Freeman et al., 2021). The VRIO criterion is illustrated in Figure 3.1 below.

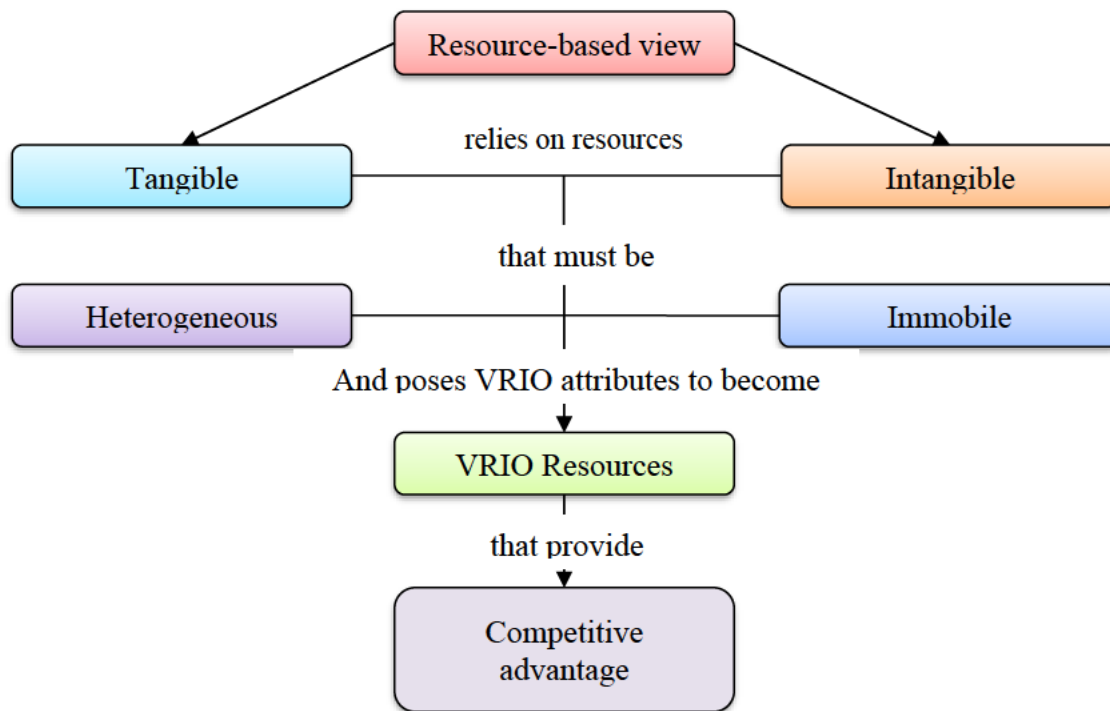


Figure 3.1: Illustration of the resource based theory

Source: Adapted from Strategic Management Insights, 2023

According to Penrose (2019), it is the business resources rather than market factors, that restrict the prospective growth of business. Therefore, a business could be motivated to diversify if they possessed the essential and additional resources to create an economic diversification in business (Pérez Sigüenza et al., 2022). During the pandemic, many SMEs found it difficult to diversify their business digitally due to lack of resources and business infrastructure (Lestari et al., 2021).

This study considered the RBT that dealt with the e-commerce process resources which included the broadband, e-shop, digital payments and logistics. The measurement of e-commerce performance and e-commerce growth takes place with the same constructs such as online sales growth, online market share and online visitors. The measurements of these constructs are used by businesses to determine the growth and performance of their website. The researchers of the tool for measuring e-commerce performance, Wade and Nevo (2005), suggested that researchers may test different constructs to better comprehend the causes of prosperous online transactions. Also, the tool can be used by researchers to determine the specific areas of strengths and weaknesses of a firm's e-commerce strategy.

Previous literature on information systems indicated that RBT was used to evaluate information technology capabilities and elucidated that the worth of a business largely relies

on the skills to use IT itself (Freeman et al., 2021). It was also revealed that the value of IT in business relies on the number of key activities in the business value chain that utilise it (Priambodo et al., 2021). The RBT is also used to validate how businesses use the investment in e-commerce to construct inimitable internet supported abilities that decide the businesses' general e-commerce success (Abbas et al., 2019). The expensive-to-duplicate characteristics of e-commerce competences are strongly linked to the resources and rooted in the process of business operations. However, there is an extent to which it varies as businesses are inimitable according to their resource abilities (Freeman et al., 2021). As a result, e-commerce will have a performance and growth advantage due to the value created through information sharing and the availability of online communities (Priambodo et al., 2021). The RBT theory developed a framework for evaluating the impact of e-commerce on SMEs. The researcher hypothesised that the e-commerce platform uses the internet's unique qualities to boost business and e-commerce growth by examining the features of online shops that take advantage of these features and to create value.

The resource-based theory incorporated the antecedents of the dynamic capabilities theory. Dynamic capabilities are varied between businesses; however, their results are similar across businesses (Warner & Wäger, 2019). The dynamic capabilities identified in this study are the moderating variables provided. The dynamic capability is generally the ability of a firm or business to incorporate and construct the external and internal resources and competences to shape the rapidly changing business environments (Mikalef et al., 2021). The essence of resources and dynamic capabilities is that if it could not generally be bought, then it must be created (Mikalef et al., 2019).

The ability to align and realign is measured by dynamic capabilities, and resources are integrated and reintegrated in order to be fine-tuned to the business environment. Specific characteristics of organisations, such as the ability to sense, seize, and transform opportunities, allow them to adapt to and coevolve with their respective business environments. The ability to do so is essential to sustained financial success (Ajgaonkar et al., 2021). During the Covid-19 pandemic, it was necessary for SMEs to evolve, align and reintegrate resources and capabilities of the business and employees. Businesses that did not have these unique transformation capabilities, especially during a pandemic, were not successful (Casalino et al., 2019).

Business owners or senior managers had to make the capability dynamic by sensing, which meant recognising and considering prospects unfamiliar to their business. During the Covid-19 pandemic, all business owners rushed to sell online as it was the only and safe way of doing business (Rashid & Ratten, 2021). There were many SMEs who did not make it due to lack of resources, capital, and capabilities. An online presence was an unfamiliar terrain for many businesses (Aloisi & De Stefano, 2022). However, there were also numerous business owners that not only went online but also used the situation to diversify their product sales portfolio to sanitizers and facemasks, and some went on to create more innovative transparent masks (Farajnezhad et al., 2021).

Another aspect was seizing which involved mobilising the business resources and utilising their capabilities to accomplish significance from the opportunities, and SMEs around the world mobilised their business by either creating or enhancing their online presence as consumers pursued online shopping. Journal articles revealed that many were successful in achieving online sales with flawless victory (Aryal & Balan, 2022).

The last characteristic was transforming which was basically endless development and learning about digital online selling platforms and adapting the business accordingly (Rashid & Ratten, 2021). The ordinary capabilities of a company enabled effective operations; however, the dynamic capabilities enabled sensing and seizing new business opportunities created, together with digitally transforming business operations. The skills to maintain and manage online consumers with satisfactory deliveries, warehousing, gaining stock suppliers, cybercrime management while using digital payments and making use of digital marketing strategies was much needed during the pandemic. Skills set in each element of the e-commerce process was needed during the pandemic to gain profitability and e-commerce growth. The dynamic capabilities theory illustrating the characteristics of sense, seize and transform are depicted in Figure 3.2 below.

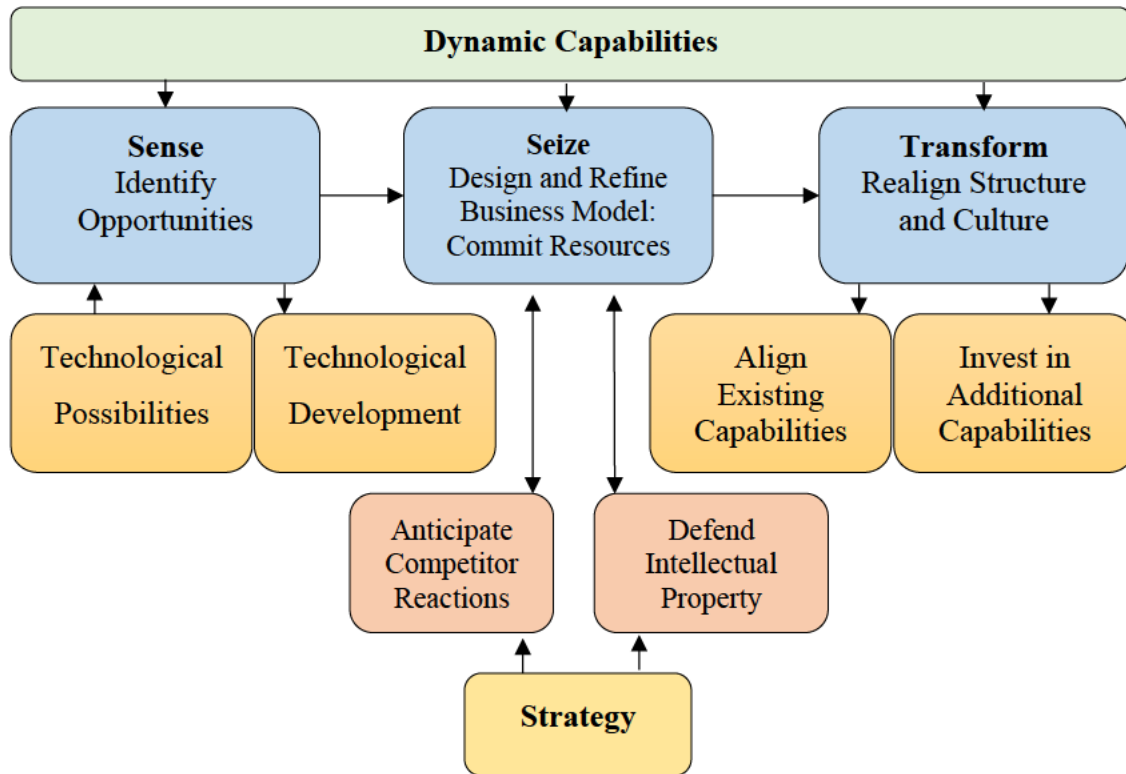


Figure 3.2: Illustration of the dynamic capabilities theory

Source: Adapted from Teece, 2018

Extending the resource-based perspective (RBV) of the company, dynamic capabilities theory was proposed by Teece and Pisano (2003). Since RBV is fixed and inadequate to describe the growth of a business in a quickly fluctuating market setting (Barney et al., 2021), it cannot be used to explain why some companies in a comparable industry performed better than others during the Covid-19 pandemic. Researchers have proposed that in order for a business to grow in the market, it must cultivate explicit capabilities and continuous learning (Wong, 2005), which is from the dynamic capabilities perspective, particularly in the new or emerging markets. This is because the process of sustaining that growth is infinite and a dynamic process (Karadağ, 2019). According to Teece et al. (1997), the dynamic capabilities can be defined as an organisation's capability to incorporate, strengthen, and reimagine its external and internal capabilities in order to swiftly respond to a shifting external context. The researcher contended that many SMEs lacked the resources to respond quickly enough and digitise their operations during the Covid-19 outbreak.

Dynamic capabilities, as defined by Eisenhardt and Martin (2000), comprise the procedure whereby existing assets are put to use in the planning and development of new assets that bring about a shift in the market. Some scholars have defined dynamic capabilities as how

businesses adapt to new circumstances, while others have suggested that they can be used to address problems with agility in the workplace (Schreyögg & Kliesch-Eberl, 2007; Easterby-Smith & Prieto, 2008). There was a positive association between dynamic capabilities and corporate performance, as shown by numerous empirical investigations (Bii & Onyango, 2018). As an illustration, Danneels (2002) studied five digital organisations and found that those with the ability to innovate their products had the greatest rate of business growth. In addition, Zott (2003) highlighted how a company's growth can be influenced by its many dynamic capabilities, and the research stressed how even a seemingly insignificant difference in capabilities can have a significant effect on the company's development. In addition, as demonstrated by Zollo and Winter (2002), a company's supremacy and continued existence are both contingent on its capacity to adapt to a constantly shifting environment. This explains why so many stores were closed during the Covid-19 epidemic. Due to the environment being governed by lockdown levels, SMEs were unable to swiftly adapt to the emerging digital landscape during the unexpected two-and-a-half-year pandemic. Additionally, Eisenhardt and Martin (2000) argued that the dynamic capabilities isolated didn't assure the growth of the business; however, the alignment of the business resources supported by the dynamic capabilities resulted in better growth than rivals. This was also reinforced by Zott (2003) who stated that the adjustment of the business resources through dynamic capabilities positively influences the business growth and not the dynamic capabilities unaccompanied.

Researchers emphasised that dynamic capabilities do not stand in opposition to the resource-based paradigm; rather, they represent an additional key component in characterising expansion (Ambrosini & Bowman, 2009; Barreto, 2010; Eisenhardt & Martin, 2000; Wang & Ahmed, 2007). In addition, a business's resources had to be flexible in order to keep up with the frantic pace of the pandemic's expanding market, and a firm's owners and managers had to be able to adapt their strategies to the changing circumstances (Monteiro et al., 2017).

3.3. Conceptual framework

This conceptual framework was developed using RBT and added representatives of the dynamic capabilities theory.

3.3.1. Broadband usage and the growth of e-commerce

The Covid-19 pandemic sparked tremendous pressure on the dependency of broadband and the use of e-commerce. Resilient and robust internet infrastructure is essential for e-

commerce (Mora, 2021; Mossberger et al., 2021; Claffy et al., 2020; Oughton et al., 2021). Globally, the Covid-19 pandemic is in the third year, yet the gap still remains as the challenges of robust internet infrastructure to use e-commerce is far from over (Gupta et al., 2022). As work has adapted to online, digitisation across all industries is accelerating and simultaneously creating a crucial need for strong internet connection to conduct business (Randell-Moon & Hynes, 2022).

It became apparent through the literature reviewed, that without access to a reliable broadband, an SME cannot do business online (Price et al., 2018; Mvambo, 2021; Majid Gilani & Faccia, 2021; Zhou et al., 2022). Broadband connectivity remains critical in terms of speed, latency, security and reliability and cost (Hampton et al., 2020), and when SMEs work from home they require quality home broadband to use e-commerce in their business operations. Broadband technology contributes to the growth of e-commerce and the economy in many ways (Myovella et al., 2020). The utilisation of broadband across SMEs increases throughput by enabling the implementation of superior efficient and effective business progressions like e-commerce, including digital advertising, stock optimisation, and reformation of supply chains (Soni et al., 2022). Mota and Cilento (2020) recommended that the extensive usage of the internet improves modernism by presenting latest functions and services like innovative methods of e-commerce. It is thus crucial to examine the points of failure and to identify solutions. The direct usage of broadband stimulates the use of e-commerce and directly affects the growth of e-commerce (Mora, 2021; Berners-Lee, 2020; Mota & Cilento, 2020; Oughton et al., 2021). Therefore, in order to explore this relationship further with respect to SMEs, it is postulated that:

H1: Broadband usage positively influenced the growth of e-commerce among SMEs during the Covid-19 pandemic.

3.3.2. Skills, broadband usage, and the growth of e-commerce

Globally, the Covid-19 crisis forced SME personnel to alter their approach of working almost instantaneously (Henderson et al., 2021). The majority of establishments realised that the different and new method of functioning in a work environment could be a blueprint for a prolonged period (Fenner & Cernev, 2021). Changes in technology and new ways of doing business with e-commerce and its digital sites have been interrupting job positions and the skills workers needed to perform them prior to the crisis period (Semerádová & Weinlich, 2020). In 2017, the McKinsey Global Institute projected that almost 375 million employees,

which equates to 14% of the worldwide workforce, would be compelled to shift careers and obtain digital proficiencies by 2030 due to cutting-edge digital platforms. In a recent McKinsey Global Survey, 87% of managers revealed that the SMEs were undergoing skill gaps within the workforce or anticipated the skills gap within the near future (Agrawal et al., 2020). However, less than half of the SME owners/managers were equipped to deal with the issues (Agrawal et al., 2020; Carlisle et al., 2021; Singh Dubey et al., 2022).

The Covid-19 crisis made the question of obtaining skills in utilising broadband more urgent (Saba et al., 2021). Saba et al. (2021) suggested that SMEs across business sectors should learn how to adjust to fast altering conditions and discover in what way to balance workforces to new responsibilities and tasks. This era could be about the role of advanced e-commerce platforms and in what way SME owners/managers could improve the skills for the staff to deliver different trading habits after the pandemic (Agrawal et al., 2020).

Alam et al. (2022) argued that SMEs face trials in operating broadband due to the deficiency in digital skills, and how its technology can be important to business profits. Corresponding investments to grow awareness and advance skills, specifically of a non-ICT skilled workforce, can increase SMEs' interest in broadband and e-commerce (Szyjewski, 2019; Alam et al., 2022; Neirotti et al., 2018). The greater the number of SMEs that provide internal ICT tuition in a nation, the better the portion utilising broadband that supports e-commerce with evidence of a stronger impact on SMEs (Szyjewski, 2019; Alam et al., 2022; Neirotti et al., 2018).

Internet skills revealed its utmost importance in the support of the usage of broadband. Therefore, in order to explore this relationship further with respect to SMEs, it is postulated that:

H2: Skills set moderated the relationship between broadband usage and the growth of e-commerce during the Covid-19 pandemic.

3.3.3. Features of the e-shop platform and the growth of e-commerce

The surge in online orders during the pandemic had a ripple effect on supply chains, customer behaviour changes, and the closure of stores (Dean & Campbell, 2020). Consumers reported frustrations as they were not kept up to date with stock levels, there was a lack of general product information and there were delays in shipment (Camilleri, 2021). These communications could have been done via the e-shop platform functionalities, which many SMEs did not take advantage of during the pandemic (Guthrie et al., 2021). SMEs needed

to guarantee that their e-shop met the requirements of consumers. This meant ensuring that the platform is convenient, reliable and attractive, rather than risking their customers turning to competitors (Al-Azzawi et al., 2021; Galhotra & Dewan, 2020). Several SMEs struggled with displaying relevant information, with accurate real time information, inventory levels and delivery tracking (Musana et al., 2020). SMEs also lacked optimisation of functionalities offered to their consumers, such as quick and easy pay options, payment of invoices online, managing their returns and discount structures (Galhotra & Dewan, 2020).

Many SMEs had newly formed an online presence during the Covid-19 pandemic, and lacked the basic features that attract consumers to the e-shop platform, damaging the search engines and impacting the growth of e-commerce, therefore, in order to explore this relationship further with respect to SMEs, it is postulated that:

H3: Features of the e-shop platform impacted the growth of e-commerce among SMEs during the Covid-19 pandemic.

3.3.4. Digital marketing strategies, e-shop platform, and growth of e-commerce

Behera et al. (2020) argued that digital marketing simplifies the e-commerce process for SMEs to monitor and offer all their potential customers their products and services and simplifies the e-shop for customers to easily find and attain product information. However, SMEs were not aware of these benefits that digital marketing can offer and thus experienced losses during the Covid-19 pandemic (Perbangsa, 2021).

Several studies examined the impact of digital marketing as a support for SMEs e-shop and the growth of e-commerce, (Adam et al., 2020), and digital marketing was evaluated to have a positive relationship with the sustainability of SMEs through the pandemic (Thaha et al., 2021; Pandey et al., 2020; Olson et al., 2021). Online advertising, affiliate marketing, email marketing, social media marketing and search engine optimisation are some of the digital marketing tools that have a constructive impact on the growth of the e-commerce industry (Nuseir & Aljumah, 2020).

The e-shop platform cannot flourish progressively on its own in a compressed interval of time (Abraham et al., 2021). Digital marketing strategies could amplify the attention gained from consumers and increase turnover (Darma & Noviana, 2020). Digital marketing strategies support the e-shop platform in many ways and streamline the e-commerce process for ease of use (Thaha et al., 2021). Therefore, in order to explore this relationship further with respect to SMEs, it is postulated that:

H4: Digital marketing strategies moderated the relationship between the e-shop platform and the growth of e-commerce among SMEs during the Covid-19 pandemic.

3.3.5. Digital payment systems and the growth of e-commerce

The Covid-19 pandemic sharply altered the desire and need for contactless digital payment systems. In the past, making a purchase was merely a transaction, however, it is now an opportunity to connect with consumers and improve their overall buying experience (Gora, 2020) and differentiate from competition (Zuyeva et al., 2020).

Digital payment technology has changed how retailers and those that have an e-commerce platform operate (Zuyeva et al., 2020). While opportunities are developed and extended to new consumers, and current customers still need to be maintained, the new digital payment technology also presents new problems with regards to customer engagement and loyalty (Siby, 2021). For example, purchasers sometimes consult peer suggestions on social media, seek recommendations on their mobile device, and even try out the product at the brick-and-mortar store, prior to finally placing the order via the e-shop (Zuyeva et al., 2020). Therefore, merging digital and brick and mortar channels into a solitary, smooth shopping experience became a critical problem for merchants whose procedures are often channel-specific and isolated (Toh & Tran, 2020). It was suggested by De Girancourt et al. (2020) to form an alliance with a financial partner who can maintain a consistent customer experience across all channels by utilising a unified payment system, which is reinforced with tokenisation tech and could facilitate acceptance of payments through a solitary platform with unified and reliable payment experiences across channels.

Researchers highlighted that the aspect of trust was one of the driving forces influencing retailers' intention to use certain digital payments (Chaveesuk et al., 2022). SMEs had high liquidity flow, and the anxiety of delays in collecting money through digital payments through unstable internet connections was a concern that influenced the adoption and usage of digital payment methods (Zuyeva et al., 2020; De Girancourt et al., 2020). Users with higher understanding of the payment system and can use them to make purchases on e-commerce platforms, have a higher rate of adoption (Bech & Hancock, 2020). Zhao and Bacao (2020) acknowledged the importance of perceived usefulness which indicated the degree of convenience of the use of technology to solve a problem.

Cashless payments boost the growth of e-commerce. De Girancourt et al. (2020) estimated that a rise in digital payments could bring economic gain. Specifically, SMEs could benefit

with mobile payments which would enable them to sell, buy, rent and get paid more easily. Therefore, in order to explore this relationship further with respect to SMEs, it is postulated that:

H5: Digital payment systems influenced the growth of e-commerce among SMEs during the Covid-19 pandemic.

3.3.6. Cybercrime management, digital payments, and the growth of e-commerce

Before Covid-19, there were many concerns around cybercrime, while making online payments and the most challenging aspect of expanding into cyberspace was handling credit card transactions (Kashif et al., 2020). In South Africa, 30 000 SME e-commerce websites were hacked every day, with 13842 attempted cyberattacks per day and 577 attempted cybercrime attacks every hour (Bulao, 2023). This reality is one that SMEs faced during the Covid-19 pandemic and a sufficient online resolution was no longer a bonus but a critical tool for survival (Ncubekezit, 2022). Research predicted that retailers could suffer losses of approximately 130 billion dollars in online fraud between 2018 and 2023 (Ncubekezit, 2022; Jiang et al., 2021). Khweiled et al. (2021) argued that charlatans looked for security failures and online perpetrators attempted fraudulent acts all the time from everywhere; therefore, all transactions of e-commerce had to be protected. Kashif et al. (2020) suggested that SMEs have to use the essential tools and possess a safety approach that infiltrates the complete business. While the issues in digital payments are extensive, the pathway to continuous success are becoming more apparent (Ncubekezi, 2022).

Combatting fraud in the payment industry has always been difficult, however, there can be far-reaching consequences for both businesses and their consumers (Trawnih et al., 2021). There has been a rise in financial crimes recently, and this trend is expected to continue as criminals become more technologically advanced and creative in their methods (Nabiebu & Akpanke, 2021). In a similar vein, cutting-edge strategies for spotting and preventing fraud have been created and put into practise, however, the cybercriminals are always trying to find new ways to upskill their tactics (Chigada & Madzinga, 2021).

Due to an increase in online shopping, including from people who never shopped online before and may be less familiar with some of the more obvious signs to be wary of, Covid-19 raised the risk of fraud (Ncubekezi, 2022). Cybercriminals knew this and were happy to take advantage of it. Trawnih et al. (2021) argued that the possibility of fraud could never be eliminated, however, more sophisticated fraud deterrence and recognition tools are being

developed by payment providers. However, despite artificial intelligence and other digital tools offering various fraud detection methods, conversely, criminals are also utilising more sophisticated methods and skills to avoid detection (Olofinbiyi & Singh, 2020; Chigada & Madzinga, 2021; Nabiebu & Akpanke, 2021). Accordingly, the effective management of cybercrime supports digital payments and hence, positively impacting the growth of e-commerce. Therefore, in order to explore this relationship further with respect to SMEs, it is postulated that:

H6: Cybercrime management moderated the relationship between digital payments and the growth of e-commerce among SMEs during the pandemic.

3.3.7. Logistics services and the growth of e-commerce

SME e-shops in particular were hit hard by encroached production and supply chains (Guan et al., 2020), and while larger e-shops could easily have found alternative sources of supply quickly, an SME retailer was ineffective if delivery failed (Rukasha et al., 2021). Consequently, if there was a single disruption in the closely knitted link of suppliers, producers, and distributors, it would be enough to be the trigger of a non-delivery (Li & Zhang, 2020; Joshi & Sharma, 2022). The danger of this setting proved treacherously extreme if the SME solely based the delivery on the drop shipping as there was no storeroom to stock goods in the event of a bottleneck (Cai & Luo, 2020).

Consumers' expectations were very high with regards to delivery standards (Srinivas & Marathe, 2021). Every two in five consumers revealed that if they endured an adverse delivery experience, they would not purchase from that e-shop again (Lukong, 2022). Srinivas and Marathe (2021) also argued that elevated shipping costs and sluggish delivery speeds could increase the shopping cart desertion rates. High shipping costs are the main reason why 44% of online shoppers abandon their carts, followed by slow delivery speeds at 24% (Tilak, 2022). Therefore, in order to explore this relationship further with respect to SMEs, it is postulated that:

H7: Efficient logistics services positively impact the growth of e-commerce among SMEs during the pandemic.

3.3.8. Logistics management, logistics services, and the growth of e-commerce

The Covid-19 pandemic revealed that several SMEs were vulnerable as they adopted a 'single-source' strategy in logistics (Mangano et al., 2022; Ferreira et al., 2021; Ali et al.,

2021). This 'single-source' strategy worked perfectly during a normal period but instantly raised problems when the chain was disrupted (Aldrighetti et al., 2021; Mangano et al., 2022; Ferreira et al., 2021; Montoya-Torres et al., 2021; Ali et al., 2021). Logistics firms were unable to fulfil all orders timeously during the Covid-19 pandemic as the demand was too high (Mangano et al., 2022; Ferreira et al., 2021; Montoya-Torres et al., 2021; Ali et al., 2021).

Due to the delayed time to fulfil orders during the pandemic, consumer services faced new challenges (Davis-Sramek et al., 2020). The rise in stress instigated by the pandemic was impacted SMEs as business owners were not trained for dealing with the large numbers of frustrated consumer calls due to unfulfilled orders (Montoya-Torres et al., 2021). There were interruptions in supply due to constrictions in logistics (Montoya-Torres et al., 2021; Sudan & Taggar, 2021; Witkowski et al., 2020). Furthermore, the mechanisms to solve these challenges were generally unreachable, and the unexpended alternatives were more delayed or more costly (Joshi & Sharma, 2022; Winkelhaus & Grosse, 2020; Rahman, 2022).

Heck (2020) argued that logistics to the consumer is an additional important accomplishment element for e-commerce merchants in the logistics fulfilment procedure and this was exceptionally delicate during the Covid-19 pandemic. This was so as shipping packages required the physical attendance of the workforce (Winkelhaus & Grosse, 2020). These fulfilment issues were combined with a high number of bottlenecks at the borders and had a ripple effect on delayed deliveries. Furthermore, certain packages were not delivered, which caused a rise in the rate of returns (Sudan & Taggar, 2021).

Fulfilling the e-commerce order is a critical part of doing business online (Quiroz-Flores et al., 2022). SME e-commerce retailers could have had the best product in the world, with a state-of-the-art e-shop, and easy digital payment checkout; however, if the order fulfilment was not streamlined the e-commerce businesses failed. During the pandemic, many SMEs that adopted e-commerce in their operations, suffered losses due to unfulfilled orders. Therefore, in order to explore this relationship further with respect to SMEs, it is postulated that:

H8: Logistics management moderated the relationship between logistics services and the growth of e-commerce among SMEs during the pandemic.

3.4. Summary

Chapter 3 reported the theoretical underpinning of the research according to the impact of Covid-19 on e-commerce among SMEs. The review led to the theory considered in this study, which was the resource-based theory combined with the dynamic capabilities theory which represented as the moderator variables.

This conceptual framework was formed through the resources and capabilities needed for e-commerce that have emerged from the review of literature and theories used. The framework reveals the challenges faced by the impact of Covid-19 on e-commerce among retail SMEs in Gauteng, South Africa. A holistic investigation into the e-commerce process was needed and the variables that moderate the process to positively influence the growth of e-commerce. This framework could assist SMEs to link their vision to the resources they have available and create a realistic vision to transform digitally and contribute to the growth of e-commerce. Additionally, should a disruption occur, this framework could provide solutions so that SMEs won't have to close.

The next chapter presents the methodology used for this research to achieve the purpose and answer the research questions.

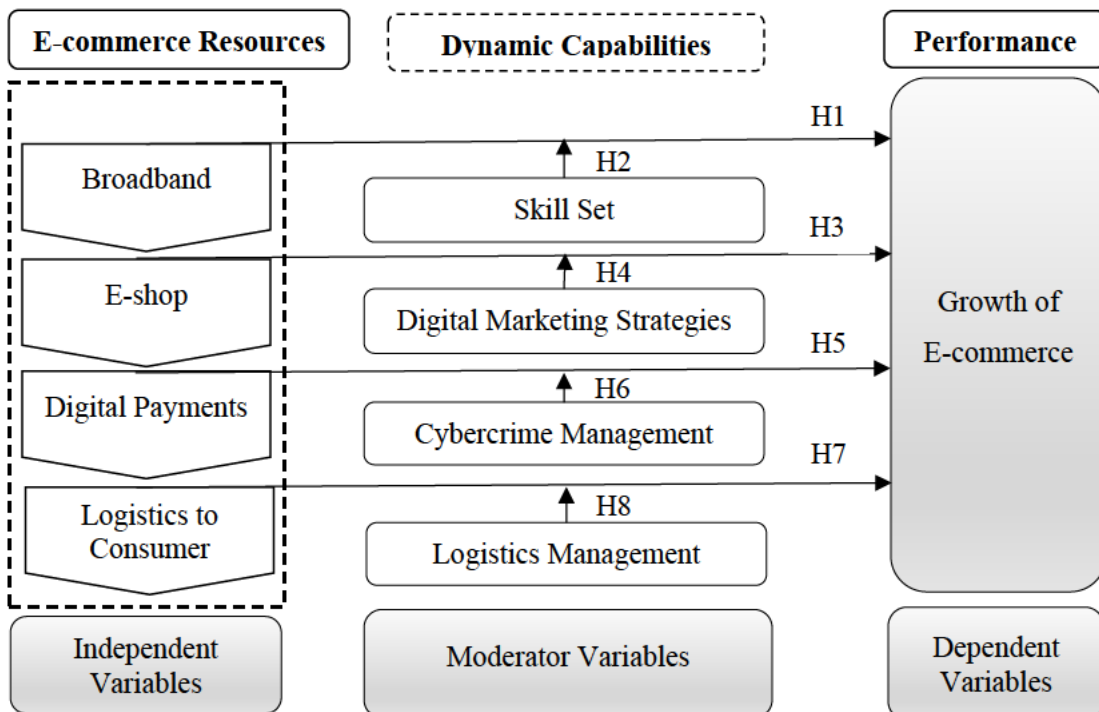


Figure 3.3: Conceptual framework

Source: Developed by researcher, 2023

CHAPTER 4:

RESEARCH METHODOLOGY

4.1. Introduction

The preceding chapters served to offer an outline of the theoretical and conceptual framework, covering relevant theories and the relationships among the variables. This chapter is a depiction of the methods and techniques that were followed in conducting the pragmatic study. It takes in account the research philosophy, research design, sampling, and tools that accurately determined the impact of Covid-19 on the growth of e-commerce among SMEs in Gauteng. The chapter concludes with an explanation of the techniques used to assure the validity and reliability of the study, as well as the strategies employed to ensure ethical considerations.

4.2. Research philosophy

According to Saunders et al. (2015), research philosophy signifies a structure of opinions and postulations dealing with the expansion of information. Defining the core values and assumptions upon which a study is based, the research philosophy serves as the study's backbone. The research philosophy chosen for this study was the pragmatism paradigm, which is associated with the mixed-methods approach and contains a multitude of techniques (Peirce, 2020; James & Dewey, 2005). A pragmatism study approaches research from a practical perspective, where information is constantly questioned and understood, and emphasises the use of the best tools possible to examine phenomena. The pragmatism philosophy seeks to improve daily practices by applying theories and concepts to reality (Mitchell, 2018). This philosophy also deals with research realistically (James & Dewey, 2005). This technique also offers an epistemological explanation via pragmatic epistemic standards by combining methods to assist in providing tentative answers to research questions (Hothersall, 2019). Pragmatism follows throughout the research allowing the researcher to collect quantitative and qualitative data concurrently and complements the abductive approach taken. Table 4.1 summarises the pragmatism philosophy and the different types of assumption related to the philosophy.

Table 4.1: Pragmatism philosophy

Ontological Assumptions (Nature of reality)	Epistemological assumption (What constitutes acceptable knowledge)	Axiological assumption (role of values)	What methods do you follow to undertake such a study?
The reality is complex and practice emerging out an idea	The research contributes one or more of the following aspects as a knowledge	The values of the researcher and respondents drive the research- value-driven research	Multiple research approach and methods appropriate to answer the research question(s) and find practical solutions to research problem are used
The reality also constitutes a flow of processes, experiences, and practices	Practical knowhow	Problems of the greatest importance to the researcher or the affected social unit typically serve as the leaping point for investigations	Range of methods, qualitative, quantitative, mixed method, and action research
There are multiple realities	The knowledge that turns into practice in a given context	Researcher is reflexive	
	Knowledge is something that enables actions, solves a problem, improves practice and process		

Source: Adapted from Saunders et al., 2015

4.3. Research design

According to Saunders et al. (2019), a research design is the complete design of the research study, that includes three distinctive but connected features, which are: the research strategy, the methodological choice and time horizon. There are three types of research designs, namely: the qualitative research design, the quantitative research design and the mixed-method research design (Saunders et al., 2019). The researcher in this study used a mixed-methods approach, and the resulting data set provided a rich tapestry of perspectives that helped understand the research subject at hand (Harrison et al., 2020). Inferential statistical approaches were used to analyse the quantitative data (Vebrianto et al., 2020), whilst themes and patterns were uncovered in the qualitative data through the use of word count and

sentence length (Creswell & Creswell, 2005). South African SMEs have faced various difficulties as a result of the resurgence of e-commerce brought on by the Covid-19 epidemic. The emergence of e-commerce among SMEs in Edenvale, South Africa was investigated using a mixed-methods methodology that elicited a wide range of insights into the issue.

From the standpoint of SMEs, the quantitative method verified the connections between e-commerce growth and the four e-commerce resources and collectively evaluated the impact of the moderating variables on the connections. The questions in the closed-ended survey had fixed answers.

The qualitative structured interviews provided a deep understanding of the difficulties encountered by the SME owner-managers with the usage of e-commerce resources and dynamic capabilities.

Previous studies identified gaps, challenges and some solutions within the e-commerce retail industry (Diaw, 2020; Ebner, 2018; Gusarova et al., 2021; Hamraoui, 2020; Kitukutha et al., 2021; Kretzschmar, 2021; Lambrechts & Sinha, 2019). However, due to the Covid-19 pandemic being a new phenomenon and considering the new issues that were unmasked with e-commerce through the pandemic among SMEs, the researcher needed to gain a holistic and in-depth view on the usage of e-commerce resources, capabilities and their effect on the growth of e-commerce during a pandemic. Some of the prior studies mentioned above, adopted either a quantitative or qualitative separately or considered the e-commerce resources individually and not holistically. However, these studies did not consider a complete dependence on e-commerce to survive. Ebner (2018), stated the importance of prevention in e-commerce fraud and conducted a full qualitative study and found that cybercriminals provide their goods and services to other criminals which is why the entry barrier is diminished, making it easier for criminals to commit crimes like e-commerce fraud. Hamraoui (2020), investigated the last mile delivery in business to consumer e-commerce, and conducted an online survey only. Kitukutha (2021), researched the impact of Covid-19 on the economy and e-commerce in Hungary and Kenya, and used a survey to collect data which did not consider e-commerce as a whole with e-commerce resources and capabilities. Moreover, with the impact of the global pandemic on e-commerce among SMEs, a mixed-method design was required, as the close ended questions would not have provided the insight that was desired and vice versa. The mixed-methods design of inquiry, which

combines qualitative and quantitative research procedures, seemed to be the best way to conduct the study because of the nature of the study and the data that needed to be studied to develop new information. Table 4.2 provides a concise summary of the benefits and drawbacks of a mixed-methods study design.

Table 4.2: Mixed-methods research: strengths and weaknesses

Strengths	Weaknesses
Data can be given context through the use of words, images and narratives	It may be challenging for a single researcher to conduct both qualitative and quantitative research, particularly if two or more methods are to be employed simultaneously
Adding numbers to text, images and narratives improves their accuracy	More expensive
It has the potential to supplement both quantitative and qualitative studies	More time consuming
A researcher can create and test a theoretical framework	
Since the researcher is not limited to a single method or approach, a wider and more comprehensive range of research questions can be answered	
Using the mixed-method in a study allows the researcher to compensate for the limitations of each	
Convergence of findings can bolster support for a conclusion	
Using multiple approaches has the potential to yield more fruitful results than relying on a single one	
Can be used to increase the generalizability of the results	
When combined, qualitative and quantitative studies yield in-depth data that can better inform policy and practise	

Source: Adapted from Sahin & Öztürk, 2019

4.4. Research approach

An abductive approach was used in this study. As seen in Table 4.3, the abductive approach is a combination of deductive and inductive approaches, and it offsets the weaknesses of each approach (Asong & Khan, 2021). Table 4.3 below thus depicts the comparison of research approaches. The Covid-19 pandemic is a new phenomenon in the retail e-commerce industry and the existing range of theories and models do not accommodate the disruption that the pandemic caused. The abductive approach complemented the study as the researcher used both quantitative and qualitative techniques and adopted a pragmatist perspective. The abductive approach was taken as the researcher aspired to analyse and explain as best as possible the overwhelming disruption in the e-commerce industry among retail SMEs. This

was done by combining both statistical and perceptive reasoning. The researcher aimed to study it both empirically as well as know the subjective opinions of SME owner/managers for better understanding. The abduction approach combined the elements of both the inductive and deductive approaches, where a conceptual framework was built, and it was empirically tested.

A summary of the three different research approaches is presented in Table 4.3 below.

Table 4.3: Research approaches

	Induction	Deduction	Abduction
Logic	The researcher makes assumptions based on data and draws conclusions without testing	When the premise of an established theory holds true, then its conclusions must hold true as well	A known premises (generally some surprising or incomplete conclusions)
Generalisation process	From specific to general	From general to specific	Interaction between the specific and the general
Generalisability	The findings cannot be generalised	The results can be extrapolated to other situations where the theory is applicable	The results are applicable to a wide range of theoretical settings and contexts
Use of data	The researcher compiles the data, looks for communalities, and ultimately develops a theoretical framework	The purpose of data collection is to put forward hypotheses about an established theory	The researcher gathers data to find themes and patterns, develops a conceptual framework, and then uses subsequent data collection to test the validity of those hypotheses
Theory	Theory can be constructed but not verified	Verification or refutation of the theory	Extant theories are combined to form new ones or to alter an existing one
When to apply	Whenever the study's central question is "why". Lack of theory to explain the phenomena	Whenever the researcher wants to know more about what is going on	When the study's central goal is to detail and verify a set of atypical or hazy findings

Source: Adapted from Saunders et al., 2015

4.5. Methodological choice

According to Harrison et al. (2020), the procedures in a mixed-methods study are categorised into the following four strategies:

- Exploratory sequential design, which involves the collection of qualitative data and then the quantitative to understand how the quantitative findings explained the qualitative findings.
- Explanatory sequential design is when the quantitative data is collected and then the qualitative data. This design is intended to use the qualitative results to clarify some of the quantitative results.
- Advanced mixed-methods design is when the researcher involves one or more of the mixed-methods strategies with a greater theoretical framework.
- Convergent parallel mixed-methods technique, which encompasses the collection and analysis of quantitative and qualitative data at the same time. This method is used whenever a more thorough and credible comprehension of an intriguing phenomenon is required.

This study used the convergent parallel mixed-methods design as the study involved SME owner/managers from various retail industries and unique challenges with using an e-commerce platform during the pandemic. This methodological choice was most suitable as both kinds of information, gathered concurrently, were about the given Covid-19 pandemic period, and all the challenges and experiences they had. The data collection for the quantitative and qualitative part of this study was done simultaneously over a period of three months. This choice mixed and integrated the different results, also contrasting and comparing them to generate well-validated conclusions. The convergent aspects are displayed in Figure 4.1 below.

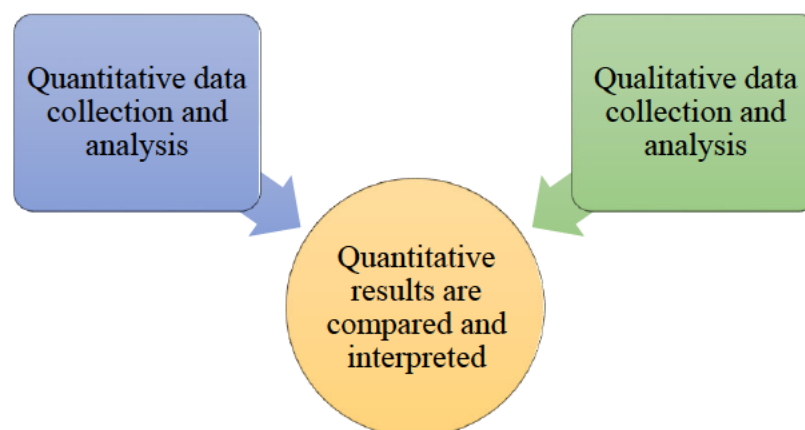


Figure 4.1 Illustration of a convergent parallel mixed-methods design

Source: Adapted from Karim et al., 2022

4.6. Research strategy

According to Creswell (2019), a research strategy stipulates the complete path of the research study, integrating the manner in which the investigation is done. Saunders et al. (2019) states that there are various types of research strategies, such as Phenomenology, Narrative inquiry, Action research, Ethnography, Grounded theory, Case study, Survey design and experimental design.

The quantitative research strategy used in this study was the quantitative survey as the researcher aimed to analyse the relationship between the independent and dependent variable, as well as the relationship of the moderating variables (Baran, 2022). A survey is used to measure high volumes of respondents which enabled the researcher to distribute the survey via email and allowed the researcher to answer the research questions (Saunders et al., 2019). The quantitative section measured and expressed data in numerical quantities. Vebrianto et al. (2020) postulated that the data collected needs to be processed to be suitable to turn it into information. It was further explained that quantitative analysis such as graphs, charts and statistics allow for the demonstration, depiction and investigation of relationships and trends within the data. Additionally, Sahin and Öztürk (2019) clarified that if the data is quantitative, it must be analysed to give meaning to the data. In this research, factor analysis and structural equation modelling (SEM) were used to analyse data. Hypotheses were examined for recommendations and conclusions.

Leedy and Ormrod (2005) stated that the phenomenological research strategy is well-suited to qualitative research designs and used to explain in what way people experience a certain phenomenon. This type of investigation aspires to seek reality from individual narratives of their experiences and feelings, and to produce in-depth descriptions of the phenomenon. Phenomenology strategy are observations or interviews, and the researcher works out why individuals make certain decisions outside of pure logical reasons (Gunawan et al., 2022). According to Neubauer et al. (2019), people do not always act according to logic and phenomenological research dives into the contributory factors of this. Descriptive phenomenology is a powerful way to understand subjective experience and to gain insights around people's actions and motivations, cutting through long-held assumptions and challenging conventional wisdom (Deakin University, 2023). It may contribute to the development of new theories, changes in policies, or changes in responses. Therefore, the phenomenological research strategy was used via interviews being conducted, as the researcher looked into the Covid-19 phenomenon and the experiences and challenges faced

by the SME owner-managers who either diversified their marketing strategy to e-commerce or who have experienced the challenges.

This strategy analyses the lived experiences of people concerning a certain topic and entails collecting of data as recounted by the participants. In this research, the participants were the SME owner/managers, and the phenomenon was represented by the Covid-19 pandemic. The analysis included thematic analysis to identify themes and make generalisations on the impact of the experienced phenomenon.

4.7. Time horizon

There are two types of research based on the time horizon of the study, namely the longitudinal and cross-sectional (Cleary et al., 2019). The longitudinal research is done over a long time period and the cross-sectional is conducted at one given point in time. This study used the cross-sectional type as it was evaluating the experience of SMEs with e-commerce during the Covid-19 pandemic.

The researcher used both descriptive and analytical research methods. The cross-sectional descriptive research is totally descriptive. The analytical cross-sectional research measures the association between two related variables. The semi-structured interviews and questionnaire measured how the moderating variables impacted the relationships between the independent and dependent variables, and the relationships purely between the independent and dependent variables. The cross-sectional option was also chosen due to time and financial practicality.

4.8. Research context

There are 2.5 to 3.6 million SMEs in South Africa, that consists of informal and formal sectors (Republic of South Africa [RSA], 2023). The Edenvale area in Gauteng was chosen because the Gauteng Province incorporates groups of cities that collectively create the monetary hub of South Africa and is the most populated province, with 15.8 million people living in Gauteng and generated a GDP of R1.59 trillion which accounted for one third of the South African GDP (Mutevedzi et al., 2022). Johannesburg, also known as the city of gold, includes commercial, industrial, and mining centres across the province (Mathe, 2020). Gauteng also contributes to 34% of the national GDP and is considered the country's most significant economic growth engine (ISSUU, 2023), also made up of 35% of total household consumption in South Africa. Gauteng, having the largest population, also constitutes the greatest number of SMEs in the country and is the most advanced in technology adoption in

comparison to the rest of the country (Mathe, 2020). This location provided valuable information with respect to SMEs utilising e-commerce during a pandemic. Due to the difficulty to obtain survey results from the 1 million plus SMEs that are in Gauteng (Statista, 2021), this location was also chosen due to convenience, cost constraints, feasibility, and time limitations.

4.9. Research population

A population in a research study is the entire number of participants that the researcher could make inferences or conclusions about (Saunders et al., 2016). According to Robinson (2014), the first concern is defining the target population which is also called the study population.

The total number of SMEs in Edenvale Gauteng is 4900 (Gauteng Business Directory, 2023). The total number of SMEs in the retail sector that have an online presence is 307 (Yellowisa, 2023). Due to the sheer size of most populations, representative samples are either impractical or impossible to obtain. As a result, researchers often utilise a sample taken from a sampling frame, or a smaller subset of the overall population of interest (Ackerman et al., 2019).

The 13 business owners that participated in the qualitative study, was drawn from the same sample as the quantitative research and was personally known to the researcher as business associates.

The individuals who are the focus of a survey are known as the target population. As part of the sampling process, researchers must establish a reference point that fits within a predetermined range of values. More information about this study's methodology is provided below.

4.10. Sample frame (Inclusion criteria)

Sampling frame defines “a frame where a sample of the target population can be drawn” (Rahi et al., 2019). A sampling frame is the set of all uniquely identifiable members of a population from which samples can be drawn (Chawla & Sodhi, 2011). This describes what the study is focused on such as people, places or businesses and so forth. The sample was chosen from the target population as follows: The eligibility criteria aligned with the proposed research plan, therefore the participants that was considered were SME owner/managers who has practised e-commerce during Covid-19. This study only included SMEs in the retail industry who had access to broadband during the Covid-19 pandemic.

The reason for this inclusion was that the research critically analysed the e-commerce process, which included broadband to access the e-shop platform, digital payments to seal the deal and finally the logistics to the consumer. Any other industry could not partake in the study as they were deemed to be irrelevant, as they could not fully use the entire e-commerce process discussed. The SMEs included only those that conducted business in the Gauteng Province, in South Africa as the entire South African population was too large and the research could be diluted. Time and costs to research the entire population were not feasible. Rural areas were also not considered in this study.

SMEs were chosen as they are the bedrock of the South African economy. When SMEs fail, the status of the economy drops. Due to SMEs being small, many do not invest in resources and capabilities that are needed for long-term digital sustainability and profitability (Boateng, 2016). SMEs in general, did not have a digital infrastructure to succeed at business (Zimuto, 2018). This tied up with the idea that e-commerce represents a prevalent growth strategy in developed and emerging economies. It was necessary to determine units of analysis as the data collection methods and sample size were guided by this. The next section describes the sampling procedure.

4.11.Sampling

A sample is a subset of a population chosen at random by researchers to answer specific study questions (Creswell, 2013). Since studying a whole population would be too time-consuming and expensive, researchers instead employ samples.

Similarly, Gabriel et al. (2019) define sampling as the method of studying a representative subset of a population to draw conclusions about the entire population as a whole from what was learned about the sample elements. A sample is a selection from a larger population (Gabriel et al., 2019). Whether a study is qualitative or quantitative in nature, it always involves designing and selecting a sample for analysis (Lohr, 2021). In addition, as was discussed before, the study's sample universe must be defined by establishing a set of inclusion criteria, exclusion criteria, or both (Robinson, 2014).

4.11.1. Sampling technique/method

Probability and non-probability sampling are used in the sampling process (Creswell, 2013). This research combined both probability and non-probability sampling techniques for its quantitative findings.

The quantitative approach employed simple random sampling (Headley & Plano Clark, 2020) because it takes the entire population into account and gives each member an equal chance of being selected. Therefore, the researcher was able to use the Gauteng Business Directory to send out a closed-ended questionnaire to all retail SMEs in Edenvale, ensuring that all retail SMEs with an online presence, were given an opportunity to participate. A reminder was also sent out, one month after the initial link was sent.

A purposeful sample chooses participants for a specific reason (Creswell, 2013). The qualitative in-person interviews used this sample technique. This sampling strategy takes the study's goals into consideration and only considers eligible participants (Creswell, 2013). Participants were selected based on their ability to give the most relevant and useful information for the study's goal—a critical analysis of Covid-19's impact on e-commerce among SMEs in Edenvale. The researcher of this study conducted in-person interviews with 13 Gauteng, South Africa, retail business owners that own or manage an SME and have made use of online sales throughout the epidemic. The researcher was able to identify participants who helped answer research questions and accomplish study goals thanks to this sampling strategy.

Participants were contacted via text, email, and phone calls to participate in the qualitative in-person interviews. Participants were given a rundown of the study's background, rationale, and benefits in order to ensure their buy-in. Saturation in terms of this type of information was attained. However, the results may be less applicable when using a non-probability sample method because the sample cannot always claim to reflect the population.

Following the selection of simple random sampling and purposive sampling for this study, the sample size and limitations stage commenced.

4.11.2. Sample size

If data is collected from the incorrect targets to solve the research problem, then the surveys are in vain (Etikan & Bala, 2017). Lohr (2021) added that a good sample would possess the following traits: the design of the sample must be a truly symbolic sample, the design of the sample must have a small error of sampling, the design of the sample must complement the finances at hand for the research and the sample should be such that the data obtained could be useful, and applied, to the world with a certain level of sureness. Rahi et al. (2019) disputed that regardless of the way the sample is achieved, it is fundamental that it be of a

sufficient size and quality to obtain authentic results that are deemed credible in terms of precision and dependability.

As stated before, the population for this study comprised the SME owner/managers in the Edenvale area, Gauteng. Small and medium-sized enterprises are the lifeblood of the South African economy, and they are categorised as firms that support revenues and number of employees lower than a given amount (Mohan & Ali, 2019). With regards to precision and dependability, it was desirable to collect data from all the SMEs under investigation; however, that would be time consuming and extremely costly (Rahi et al., 2019). The target population for the quantitative questionnaire was 307 SMEs in the retail industry with an online presence, and the sample was calculated to be 171 using a confidence level of 95%, margin of error at 5% and population proportion of 50%. Generalisability was important to this research and therefore an attempt was made to ensure that all retail industries in the population participate. The link was sent to all 307 retail SMEs in the Edenvale area.

For the interviews, 13 business owners were selected these participants was drawn from the same sample as the quantitative research, and their businesses had to have the following criteria in order to be included as a participant:

- The business had to be in the retail industry.
- The business had to have had access to the internet during the pandemic.
- The business owner or a very senior manager had to be willing to answer the interview questions.
- The SME had to have an online presence.

Table 4.4: Businesses used for the qualitative interviews

Business	Industry
Company A	Retail honey powder
Company B	Retail manufacturing
Company C	Retail manufacturing
Company D	Retail computer and electronics
Company E	Retail electric components
Company F	Retail heavy duty tools
Company G	Retail batteries
Company H	Retail computer and electronics
Company I	Retail computer and electronics
Company J	Retail cleaning products
Company K	Retails PPE
Company L	Retail sound bars and electronics
Company M	Retail

Source: Developed by researcher, 2023

Having described the population of the research, and sampling strategies as well as sample size, it is appropriate to discuss the research instruments which were used for data collection.

4.12. Data collection instruments

Krosnick (2018) highlighted that the questionnaires, interviews and observations of people were the foremost data collection techniques in survey research. Sharma and Kumar (2022) added that research methods are techniques that are used to gather information to reach sound conclusions. It is crucial to select an appropriate method of data collection as it can affect the accuracy and reliability of the surveyed data.

The instruments used in this study are explained in the following subsections.

4.12.1. Questionnaires as a research tool for the quantitative method

According to Sharma and Kumar (2022), a questionnaire consists of a series of well-structured questions selected after extensive testing with the goal of eliciting honest feedback from a specified group of respondents. There are several interconnected tasks that need to be thought through before, during, and after a survey is administered. The questionnaire's overarching layout, its validity through pre-testing, and its administration method all fall

under this category. When trying to contact a significant population spread across a wide geographic area, questionnaires can prove invaluable (Ganesha & Aithal, 2022). They can also help businesses collect a huge number of opinions for use in making better decisions.

The quantitative component of this study was easily administered through online surveys. This is because the result of an electronic survey is of a higher quality and may reach more people, cost less money, and be completed more quickly. Using electronic surveys also allows researchers to easily quantify responses, summarise findings, and analyse the completed questionnaire (Ganesha & Aithal, 2022). In addition to protecting the privacy of the respondents, questionnaires can yield a wealth of information that can be tallied with the click of a mouse in any modern spreadsheet programme (Sharma & Kumar, 2022). On the other hand, surveys have a number of limitations that make them less desirable to use, including a low response rate, length and complexity constraints, and the difficulty of locating non-respondents (Ganesha & Aithal, 2022).

4.12.1.1. Questionnaire design

The questions used in this study were standardised after being taken from other research conducted in the field of online commerce. When conducting research, it is important to create a standardised questionnaire so that all participants are asked the same questions and their responses are recorded in the same way (Boynton & Greenhaulgh, 2004).

Table 4.5: Summary of sources that were used for items in the questionnaire

Questionnaire	Sources used
Section B – Broadband usage	(Chinomona, 2013)
Section C – Skills	(Van Deursen et al., 2012)
Section D – E-shop features	(Fauzi, 2018)
Section E – Digital marketing strategies	(Mahmutović, 2021; Giantari et al., 2022)
Section F – Digital payments	(Susanto et al., 2022)
Section G – Cybersecurity	(Da Veiga, 2016)
Section H – Logistics services	(Mishra & Sharma, 2014)
Section I – Logistics management	(Chinomona, 2013)
Section J – E-commerce performance/growth	(Zimuto, 2018; Mohamed et al., 2018)

Source: Developed by researcher, 2023

There were 98 questions in total, separated into ten categories on the questionnaire (Appendix A). Section A included the demographics of the respondents.

For each statement in Sections B, C, D, E, F, G, H, I, and J of the questionnaires, respondents were asked to indicate their level of agreement using a five-point Likert scale, with pre-coded responses ranging from one to five. Section B of the survey asked 15 questions about respondents' broadband usage habits during the epidemic; responses could be "strongly agree" or "strongly disagree" on a five-point Likert scale. The survey's questions were meant to gather data about the ways in which internet use has influenced the growth of e-commerce.

Section C of the questionnaire included ten items related to the skills construct, each on a five-point Likert scale with responses ranging from "strongly agree" to "strongly disagree." The questions aimed to gain understanding of what type of skills the SMEs had within the business and how skills moderated the relationship between broadband usage and e-commerce growth during the pandemic.

There were 17 items about e-shop features rated on a five-point Likert scale (from "strongly agree" to "strongly disagree") in Section D of the questionnaire. The questions attempted to gain insight into what type of e-shop features were used during the pandemic and how it affected e-commerce growth.

Eleven items on a five-point Likert scale, from "strongly agree" to "strongly disagree," made up Section E. The questions pertained to the respondents' usage of digital marketing in their business during the pandemic and aimed to gain understanding of how digital marketing moderated the relationship between the e-shop and e-commerce growth during the pandemic.

Nine questions related to the digital payments construct were asked in Section F of the questionnaire, with responses ranging from "strongly agree" to "strongly disagree" on a five-point Likert scale. The questions aimed to gain understanding of how SMEs used digital payments during the pandemic and its impact on e-commerce growth.

In Section G of the survey, 12 questions related to cybersecurity were asked on a five-point Likert scale, with responses ranging from "strongly agree" to "strongly disagree." The questions aimed to gain understanding of what type of cybersecurity the SMEs had within the business and how cybersecurity moderated the relationship between digital payments and e-commerce growth during the pandemic.

Within the context of the logistics services construct, Section H had six questions and elicited responses ranging from "strongly agree" to "strongly disagree" on a five-point Likert scale.

The questions attempted to gain insight into the efficiency of logistics during the pandemic and its impact on e-commerce growth.

Six questions about the logistics management construct on a five-point Likert scale, with options ranging from "strongly agree" to "strongly disagree", were posed in Section I. The questions attempted to gain insight on the integration of logistics management and how it moderated the relationship between logistics services and e-commerce growth.

There were seven items about e-commerce growth rated on a five-point Likert scale (from "strongly agree" to "strongly disagree") in Section J of the questionnaire. The questions pertained to the respondents' online profitability and market share during the pandemic.

Table 4.6 contains a list of the research questions and the parts in the survey that answered each research question, given that the instrument was developed to satisfy the research questions and objectives of the study.

Table 4.6: Research questions

Research question	Section in questionnaire
1. What impact does broadband usage have on the growth of e-commerce among SMEs during the pandemic?	Section B and J
2. What impact do e-shop features have on the growth of e-commerce among SMEs during the pandemic?	Section D and J
3. What impact do digital payment systems have on the growth of e-commerce among SMEs during the pandemic?	Section F and J
4. What impact does efficient logistics have on the growth of e-commerce among SMEs during the pandemic?	Section H and J
5. Does dynamic capabilities moderate the relationship between e-commerce resources and the growth of e-commerce?	Section C, E, G, I and J

Source: Developed by researcher, 2023

The survey (Appendix A) was constructed from the literature reviewed by the researcher (presented in Chapters 2 and 3). The questions were ordered in a way that would not to confuse the respondents. Easy-to-answer questions, such as biographical details were asked first so that the respondents could be put at ease. Questions of the same topics were kept together as per the literature review.

Together with the questionnaire, a covering letter (Appendix A) was administered, explaining the purpose of the questionnaire. The intention was to make questions as easy

and as clearly understandable as possible. A five-point Likert scale was utilised for the survey, and technical terminology was avoided whenever possible.

4.12.1.2. Pretesting, reliability, and validity of the research instruments

To determine the research instrument's validity and reliability, it is necessary to first define these terms and then explain how they applied to the investigation in this study.

Reliability is the extent to which a scale consistently produces results after multiple measurements of a characteristic (Cohen et al., 2017), and affiliates with Saunders et al. (2016), that emphasised, an instrument is reliable when yields consistent results. A common reliability measure is the Cronbach's alpha coefficient, which indicates the degree to which components in a set are related. The closer the Cronbach's alpha is to 1, the higher the internal consistency and reliance (Ganesha & Aithal, 2022). Composite reliability can be considered an alternate measure of reliability (Cohen, 2017). The composite reliability should be 0.7 or greater in order to indicate that all items measured the same construct throughout the questionnaire (Ganesha & Aithal, 2022).

The researcher used the Cronbach's alpha to measure the internal consistency of the items which loaded into one factor during the exploratory factor analysis, and the composite reliability was utilised to verify the constructs when confirmatory factor analysis was applied.

If the instrument is accurately measuring the target concept and not some other variable, then it might be considered valid (Sekaran, 2009).

Pretesting a questionnaire is crucial for ensuring that all questions are clear and that the instrument itself is free of grammatical or measurement errors before it is given to respondents (Sekaran, 2009). According to Grimm (2010), pretesting is a crucial step in minimising survey research-related errors and greatly enhancing data quality.

i. Pretesting the questionnaire

Pretesting the questionnaire with a subset of respondents who are representative of the target population improves its reliability and validity, as stated by Ganesha and Aithal (2022). The number of participants in the preliminary test of this study was set at ten, even though the optimal range is between four and 30 (Sharma & Kumar, 2022).

Ten business owners that were apart of the target population of 307 participants, were used to pilot test the electronic questionnaire to ensure it was clear and could be understood in the

way it was intended for the study. The questionnaire was modified by rephrasing some questions to remove ambiguity based on comments from the pilot test. The questionnaire was also condensed and divided into ten parts so that respondents could give their whole attention to each. By doing these tests ahead of time, it was fixed before it was administered it to a large sample of respondents via questionnaire, which helped the researcher to obtain more accurate results (Sekaran, 2009).

ii. Validation of the questionnaire

Validity could be measured in different ways. The two most popular ways are content validity and construct validity. Construct validity refers to the extent to which a measurement tool can attest to how well its results fit the theories it was developed to assess (Sekaran, 2009). The questionnaire’s reliability and validity were evaluated using Cronbach’s alpha. Sekaran (2009) stated that Cronbach’s alpha is the most widely used reliability test for scaled items. The Cronbach’s alpha reveals excellent reliability when tested result is closest to 1 (Sekaran, 2009). This is discussed further in Chapter 5.

iii. Administration of the questionnaire

A questionnaire can be administered in different ways in order to collect data, namely through the mail, via fax, in person drop-off, over the telephone, electronically via e-mail or hosted internet website or mobile phones and tablets (Sekaran, 2009; Zikmund et al., 2013). The advantages and disadvantages of each of the ways of administering the questionnaire were summarised by Ganesha and Aithal (2022) and are presented in Table 4.7.

Table 4.7: Advantages and disadvantages of questionnaire administration

Method of administration	Advantages	Disadvantages
In-person interviews	A high degree of confidence in information collected as it is in-depth	Inconvenient, costly and easily disregarded as anecdotal
Mail surveys	No limits on who or what the researcher can contact	Expensive, data collection errors, lag time
Phone surveys	High degree of confidence, capable of engaging with anyone	Too expensive and time consuming
Online surveys	Affordable, user-controlled, and highly error tolerant data collection	Possibility that not every participant has access to email or the internet

Source: Adapted from Ganesha and Aithal, 2022

The gathering of the data needed to be facilitated in order to obtain a straightforward classification (Sekaran, 2009). Questionnaires were administered electronically via mail for this study.

Generally, the companies included in the sample for this study were very willing to participate, even though the respondents were often very busy, and it was difficult to get them to fill in the questionnaire. Thus, to try to obtain the maximum response rate, reminder invitation e-mails were sent to the outstanding respondents.

4.13. Structured interview as a research tool for the qualitative method

4.13.1. Interviews

According to Bougie and Sekaran (2019), an interview is a group discussion that the researcher starts in order to gather data and information from the participants. Interviews are the most effective approach for gathering data when addressing complicated and delicate issues, according to Sharma and Kumar (2022). The interview is meant to help the researcher see the world through the eyes of the participant, which can lead to more reliable information that can be used to answer the research questions and concerns. In-person, telephone, and web-based interviews can be conducted in a variety of structured, semi-structured, or unstructured ways (Williams & Moser, 2019).

An unstructured interview has flexibility in terms of sequence of questions and content. The interviewer has complete freedom to ask added questions depending on the discussion. This type generally takes the form of a conversation and with an intent that the researcher, with the interviewee, explores the views and experiences about certain incidents of a phenomena (Williams & Moser, 2019).

A structured interview is when the researcher asks a set of questions that are predetermined and follow a schedule (Sharma & Kumar, 2022). A schedule of the interview is a list of questions developed prior to the interview happening and it is known in advance what information is required. Unstructured interviews are compatible if the problem of the research is diverse and wide ranged, and the researcher would need to identify the problems relevant to understanding the situation (Williams & Moser, 2019). Interviews were selected to collect the qualitative information as the design provided significant communication between two individuals and this provided in-depth descriptions. The interviews enhanced the understanding of the challenges that SMEs in Edenvale faced with e-commerce during Covid-19.

As previously stated, for the qualitative research section of this study, a structured interview was used. The qualitative data from interviews enriched the understanding of SME owner/managers' experiences with e-commerce during the pandemic.

4.13.2. Interview guide design

The information presented in the literature review chapters together with the research questions were used to develop meaningful questions for the interview guide.

The design of the interview guide was based on the recommendations of Sekaran (2009). Eighteen open-ended questions were included in the interview guide. Simple questions were asked at the beginning of the interviews to get a background of the business. Questions that followed were more direct and tried to identify the direction the business took with the usage of e-commerce and the challenges experienced. The interview guide is included in Appendix B.

The interviews were structured in a way that aimed to keep participants engaged throughout the time allotted for them. The interviews were held at the interviewee's offices or online. The duration scheduled for each interview was a maximum of 30 minutes. All interviews were audio recorded using a voice recorder on a phone with pre-arranged permission from the participant. In addition to audio recordings, the researcher kept written notes.

It was important for the measuring instruments, as described in this chapter, to be reliable and valid.

4.13.3. Validating the interview guide

Face validity was used to give quality, credibility, and trustworthiness to the qualitative section of this study. As previously mentioned, face validity refers to the extent to which it measures what it is supposed to measure (Sekaran, 2009). This is difficult in human sciences, since the instruments need to measure human emotions like anger and happiness (Creswell & Poth, 2016).

4.13.4. Pretesting the interview

A pre-interview test is also a crucial part of preparation for the interview. If there are any problems, restrictions, or other shortcomings in the interview design, the researcher can fix them in advance to the implementation of the study (Turner III et al., 2010). A pre-test of the interview questions provides the opportunity to perfect each question's concept and wording. The researcher conducted the pre-test of the interview guide with two participants

from the sample. Each participant received the interview questions one week in advance. This was done so that the respondents could familiarise themselves with the questions and know what to expect. The initial interviews were face to face and were not recorded. These informal interviews and dialogues were conducted to locate and correct weaknesses in the development of the concepts and questions. The feedback from these informal interviews provided the researcher with information to ensure that she was following the proper protocol of data collection procedures to safeguard objectivity in data collection. A revised interview guide was created after hearing from those who used the pilot version. Appendix B includes the final version of the interview guide that was utilised for the research.

After testing and checking the validity and reliability of the research instruments, the researcher needed to determine best data capturing methods as well as analyse the collected data. This is explained in the next sections.

4.14.Data capturing methods

The survey was hosted by Google forms, an on-line survey hosting website. An electronic questionnaire was chosen primarily because one of the characteristics or requirements for a respondent was to have access to a computer with access to the internet. E-mail addresses of the prospective respondents were obtained from the Gauteng Business Directory, and an invitation e-mail was sent to these individuals explaining what the research was about. The e-mail contained a hyperlink to the web page that hosted the questionnaire. Respondents clicked on the link, provided consent to continue and completed the questionnaire.

The interviews were recorded using a phone voice recorder whilst the researcher wrote key notes on paper. The recordings were then cross-checked by the interviewee and the researcher before departure. The records were dated and labelled, together with the location and company that was interviewed. A written record (transcript) of what had been said during the interview was made for the purpose of data analysis.

4.15.Data analysis methods

The researcher has an obligation to check the collected data for completeness and accuracy before proceeding with analysis (Hair et al., 2007). Preparing the data for analysis is a necessary first step. The usual methods of editing and encoding were used to accomplish this. The common steps in data analysis are data reduction, summary creation, pattern detection, and statistical analysis (Blumberg et al., 2011). This was carried out in accordance with the goals of the research. To find explanations for questions through the use of scientific

methods and the discovery of causal relationships between variables is what research is all about (Kothari, 2009).

According to Sekaran (2009), a variable is something that can be assigned different values at different times for the same entity. The purpose of this research was to identify and clarify the interactions between the subsequent independent and dependent variables.

4.15.1. Independent variables

According to Weathington et al. (2012), an independent variable is a variable that is expected to cause or account for a change in the dependent variable. The following were independent variables in the study relating to the e-commerce resources:

- Broadband
- E-shop
- Digital payments
- Logistics

4.15.2. Dependent variable

Based on previous literature, e-commerce growth or performance was dependent on the resources of the business, therefore the e-commerce growth was the dependent variable in this study.

4.15.3. Moderating variables

According to Kadhim (2021), a moderating variable can either strengthen or diminish a relationship between two variables. The dynamic capabilities posed as a moderator between the relationship of the independent variables and performance in many studies (Odwaro et al., 2022; Bii & Onyango, 2018). This study also used representatives of the dynamic capabilities as moderating variables, such as skills, digital marketing strategies, cybersecurity and logistics management.

4.15.4. Analysis of quantitative data

This study tested the theories and concepts presented in the literature review chapter and statistically determined the causal relationship between the various independent variables and the dependent variable. The study consequently aimed to analyse the challenges of using e-commerce during the pandemic, and its impact on the growth of e-commerce.

By condensing a great quantity of information into a manageable summary, descriptive statistics were applied to summarise the essential descriptions of the facts for this study. Sample descriptions were summarised, and the measurements are provided. The information gathered for this study is described in this thesis using tables, frequencies, and central tendencies.

4.15.4.1. Inferential statistical techniques

Researchers can use inferential statistical techniques to assess if the data confirms or contradicts the study's premise and whether it can be applied to a larger population. To address the study objectives and establish the necessary connections between the study variables and constructs, a number of analytical methodologies were used in this study (Hair et al., 2007).

4.15.4.2. One-sample t-test

A numerical postulation test called the one sample t-test is used to establish whether an unknown population mean deviates from a given value. The one-sample t-test was used to establish whether a significant agreement or disagreement existed for each question, which was graded on a five-point Likert scale. A comparison between the average agreement scores and the centre score of "3" was made. Major agreement was assumed if the mean was more than 3, and significant disagreement was assumed if it was less than 3 (if mean 3) (Shrestha, 2021).

4.15.4.3. Exploratory factor analysis

Validating scales of survey items is done using exploratory factor analysis (EFA) (Shrestha, 2021). Using fewer variables known as latent variables, EFA aims to characterise a multidimensional dataset (Shrestha, 2021). CFA, one of the elements of structural equation modelling (SEM), can be used once a questionnaire has been validated. Principal component analysis (PCA) and factor analysis are two extensively used techniques for factor extraction (FA). PCA is basically a data reduction technique, according to (Samuels, 2017), that examines the relationship between the variances of the measured items and the overall variance shared by items. The link between the measured items' variances and their shared variances is examined through factor analysis. Its objective is to find latent variables that contribute to covariance among the measured items (Samuels, 2017). Promax rotation with Kaiser normalization was used in this investigation.

The following stages were undertaken for the factor analysis:

- To determine whether the sample size is adequate to reliably extract factors, the Kaiser-Meyer-Olkin measure of sampling sufficiency was utilised. According to (Hadi et al., 2016), values between 0.7 and 0.8 are good, with values exceeding 0.9 classified as superb.
- To ensure that items are not correlated too lowly with each other, a significant Bartlett's test is needed.
- The factor extraction process is an iterative one. After each iteration, several parameters need to be checked, the analysis specifications adjusted accordingly, and the analysis re-run. When dropping of items is indicated, one item should be dropped at a time.

The following criteria were used in this study:

- Communalities – the ratio of an item's unique variance to its shared variance should be at least 0.2. If any communality is lower than 0.2, the item should be dropped.
- Retain factors with eigenvalue larger than 1. Factors must only be preserved if they have at least three items with loadings greater than 0.4 and low cross loadings
- Remove items with low loadings, for example, no loading $> .3$
- Remove items that cross-load. The criterion that can be applied is to remove an item with a cross-loading value that exceeds 75% of the largest loading
- The total variance extracted should exceed 50%.

4.15.4.4. *Structural equation modelling*

Structural equation modelling (SEM), a statistical evaluation tool, utilises two or more structural equations to generate theoretical concepts and validate postulated causal linkages (Hair et al., 2015). In structural equation modelling, a suggested model in which the causal links between the model's constructs are stated is used to build a number of unconnected but linked multiple regression calculations. Analysis of the measurement model examines the connections between the measured questionnaire items and the latent constructs (Rosseel, 2020). The extent of the model fit, the standardised residuals and explained variances of the measured items, and the sufficiency of the factor loadings are all assessed using confirmatory factor analysis (CFA). The construct validity and reliability of the model constructs are assessed using this data. The next step entails testing hypotheses and analysing the structural model that illustrates the causal pathways.

- The measurement model

For the initial CFA in this investigation, the questionnaire items that grouped together in the EFA to generate the factors (constructs) were used. The individual parameter estimations were assessed prior to the model's overall evaluation. First, each item should be significant, meaning that it is statistically distinct from zero, and loadings of the measured items should be at least .5 and ideally .7 or higher (Hair et al., 2015). Items that don't meet the significance requirement should be eliminated.

Model fit indices are used to evaluate the entire model after the individual elements have been evaluated for sufficiency and, if necessary, the model has to be adjusted. Additionally, each construct's validity and reliability are evaluated.

Multiple fit indices are used to assess the original measurement model's fit. The indices and criteria utilised in this investigation are displayed in Table 4.8.

Table 4.8: Fit indices

Fit indices		Fit value criteria
χ^2 / df (p-value)	Chi-squared df-degrees of freedom	<5
IFI	Incremental fit index	>.9
CFI	Comparative fit index	>.9
RMSEA	Root mean square error of approximation	<.08

Source: Developed by researcher, 2023

The modification indices and residuals are looked at, and the model is re-specified if the model fit is deemed to be inadequate. Items with significant residuals (>2.56) or those that desire to load onto another construct (>3.89), according to Hair et al. (2015), should be eliminated. In this investigation, this procedure was used.

The following formulas are used to determine the composite reliability (CR), average variance extracted (AVE), and maximum shared variance (MSV) in order to evaluate the measurement model's reliability and construct validity, which include both convergent and discriminant validity (Fornell & Larcker, 1981). Calculating shared variance (SV) involves multiplying the correlation between two constructs by their square. The maximum of all SV values that apply to a given construct is known as MSV.

The criteria used to evaluate if reliability and validity was achieved are listed in Table 4.9 (Rosseel, 2020).

Table 4.9: Reliability and validity criteria

Reliability and validity	Criteria
Composite reliability	CR > 0.7 and
	Loadings > 0.5
Convergent validity	AVE > 0.5 and
	CR > AVE
Discriminant validity	AVE > MSV

Source: Developed by the researcher, 2023

The second stage of the SEM process can begin once all aspects of the measurement model evaluation process have been completed, the model constructs have been determined to demonstrate construct (convergent and discriminant) validity as well as reliability, and the model fit has been determined to be sufficient.

- The structural model

The final measurement model from step one is converted into the structural model by changing the double-arrowed covariance arrows into directional causal arrows that represent the relationships between constructs in the proposed model. The model fit is tested using the same indices as were used for the measurement model.

4.16. Analysis of qualitative data

An essential step in the analytical process is getting qualitative data ready. Before analysis can begin, there are a number of processes that must be completed, including transcription, coding, and developing themes.

4.16.1. Transcribing and coding of qualitative data

Field notes, video recordings, interviews, observations, and other types of data collection can take a very long time and demand careful inspection, comprehension, and reading (Creswell & Poth, 2016). As a result, the strategy for data analysis needs to be well organised.

It was necessary to become familiar with the audio recordings, in order to do this efficiently, the researcher listened to the recordings repeatedly and additional notes were made.

Thereafter, it was essential to transcribe every audio file from the interviews that were done for this investigation. This was executed exactly. After transcribing, the audio interviews were listened to again to make sure nothing had been left out. The data needed to be coded after the recordings had been transcribed and confirmed. Reading carefully over the transcribed data and separating it into useful analytical units is the process of coding (Creswell & Poth, 2016). Essentially, it implies that while you read the transcription, significant passages will be annotated with symbols, adjectives, or special code names. The researcher aimed to answer the research questions and considered that carefully when the initial codes were organised, and coded each part of collected data that was relevant or captured something interesting about the research question. After a comparison of codes among the transcripts were done, it was modified. Following the identification of the codes, the data was analysed to identify any themes that might have been suggested by the participants, such as patterns relating to the e-commerce resources, and the challenges experienced with their capabilities for e-commerce.

4.16.2. Thematic analysis

Thematic analysis is a method that identifies repetitions in the data collected (Braun & Clarke, 2006 p. 91-92). No software was used for the qualitative thematic analysis, the researcher used Microsoft excel to arrange the codes and themes (Bree & Gallagher, 2016). The data associated with each theme was identified and colour coded. The researcher then read the themes considered and assured that the collected data supported it. Additionally, it was ascertained that the themes identified were in context of all the interviews dataset and not just a single interview. The themes identified were the challenges around broadband connectivity, skills to overcome those challenges, enhancing features on e-shop platforms, digital marketing strategies to boost the online shop, diverse methods of digital payments and cybercrime management during the pandemic. Logistics services and management was also found to impact the growth of e-commerce.

After the themes were identified, the themes were then reviewed to create a better understanding of the themes that were identified (Bree & Gallagher, 2016). Themes must be clear and should be distinct from each other. Considerations included these questions:

- Are the themes clear?
- Is the data consistent with the themes?
- Is the researcher attempting to overpack ideas into a single theme?

- Are they actually distinct themes if they overlap?
- Are there any sub-themes?
- Are there any additional themes in the data?

The researcher was very thorough in this process and found no overlap in themes. All themes identified made sense and assisted in answering the research questions.

Lastly, the themes were refined into thematic maps seen in the findings in Chapter 5. The maps illustrated the relationships between the themes and the narratives were discussed in the write-up part of the analysis. The in-depth meaningful data was slotted into sections that answered the research questions and objectives accordingly. The analysis of the qualitative data provided the rich insight and reasons for some of the unusual results from quantitative data.

4.17. Analysis of mixed methods data

As stated, this study employed a convergent mixed-methods design, in which both forms of data were gathered concurrently and with regard to the same issue. The two data types can be combined or integrated at several points in the research process, including data collection, data processing, and the interpretation of study findings (Levitt et al., 2018). The next step was to combine and then interpret the data once the quantitative and qualitative data had been analysed using the procedures and statistical techniques described in the preceding section. Comparing, contrasting, and synthesizing the many study outcomes during interpretation is necessary to demonstrate cohesive conclusions (Creswell & Poth, 2016). When discussing the study's results, information from the qualitative stage, quantitative stage, and literature review was combined. Data from the interviews in this study can supplement and clarify complicated or contradictory questionnaire results.

4.18. Ethical considerations

According to Creswell and Hirose (2019), ethics are guidelines that researchers follow to protect their participants, and this is a strategy for building trust with them. The ethical requirement protected against improper conduct and misconduct on the part of the participating businesses and promoted the study's integrity. The subsequent ethical reflections were monitored in this research.

4.18.1. Informed Consent

In accordance with University of KwaZulu-Natal policies, authorisation to conduct the research was obtained from the Humanities and Social Sciences Ethics committee, and ethics in research also informed participants of their rights (Appendix C). All the information from the informed consent document, detailing all contact details, the research content and participant rights to participate, were attached to each online questionnaire in order to provide the option of terminating their participation in this research at any point.

The interviewees were also emailed a copy of the informed consent and their rights to decline at any point without having to provide a reason.

4.18.2. Confidentiality

In order to maintain confidentiality and the right to autonomy, the corporate names and interview subjects were changed to pseudonyms for the interviews with participants who had been nominated. As a result, the study that will be published has not used the names of specific people or companies to protect their privacy.

4.18.3. Anonymity of participants

Respondents were ensured that the research was completely anonymous and no personal information was requested with regards to the online questionnaire. There was no link to their email addresses, nor was any names or other linking details requested. Only consent to continue was required, therefore, there was total anonymity in their participation.

4.18.4. Managing the data

The data received will be safe and secure using the following:

- The data will be encrypted.
- There will be limited access to only those that require it and have been identified within approved protocol.
- The researcher will dispose of data by means of Clearing, which removes data in such a way that prevents an end-user from recovering it.

4.18.5. Ethical clearance

The application for ethical clearance outlined the significance of the study, the methodology of the research, and the steps the researcher would take. The gatekeepers' letters (Appendix D), which provided written permission from the business owners for the interviews, were

also attached. The online survey participants had a choice at the outset as to whether they would like to continue or decline to participate. The ethical clearance was accepted, and permission was granted to pursue the research.

4.19. Summary

This chapter described the research design, sample techniques, and data collection tools, as well as the research methodology that was employed to carry out the study. Prior to defining the research aim, objectives, and questions, the research problem was first identified. The SME owners and managers who worked in the retail sector in Edenvale region in Gauteng and engaged in e-commerce during the pandemic were the population that was targeted. Thirteen interviews with SME owners and 212 SME owner/managers made up the sample population from which the data was taken.

To provide a thorough and detailed account of the difficulties and experiences with e-commerce during the pandemic, a mixed-methods strategy was employed. This strategy was also utilised to make up for each method's shortcomings. For instance, the quantitative, closed-ended questionnaire didn't give SME owners the opportunity to elaborate. However, the online survey's viability and speed helped to reach a wider audience of participants.

The research findings and analyses for the completed quantitative online questionnaires and the qualitative interview data are presented in Chapter 5.

CHAPTER 5: RESEARCH FINDINGS AND ANALYSIS

5.1. Introduction

Chapter 4 outlined this study's approach to data collection and the research design and methodology used. The research aim was to critically evaluate the challenges faced by SMEs with e-commerce during the pandemic. The data that was gathered from the survey is presented in this chapter using descriptive and inferential statistics and the data collected from the interviews with SME owners is presented thereafter.

5.2. Quantitative research findings

5.2.1. Response rate

The questionnaire was sent out to 307 SMEs in the retail industry in Edenvale, Gauteng, using a Google form link. Although the sample size was calculated as 171, the statistician advised that a minimum of 200 responses would be needed, considering the variables in the conceptual model. Thus, 212 completed questionnaires were received, and the data analysed.

5.2.2. Demographic profile of the respondents

Figure 5.1 reveals that most of the respondents were male (70.8%) in comparison to female (29.2%). The respondents in the 30–39-year age group were most represented, followed by those in with age group of 40-49 years.

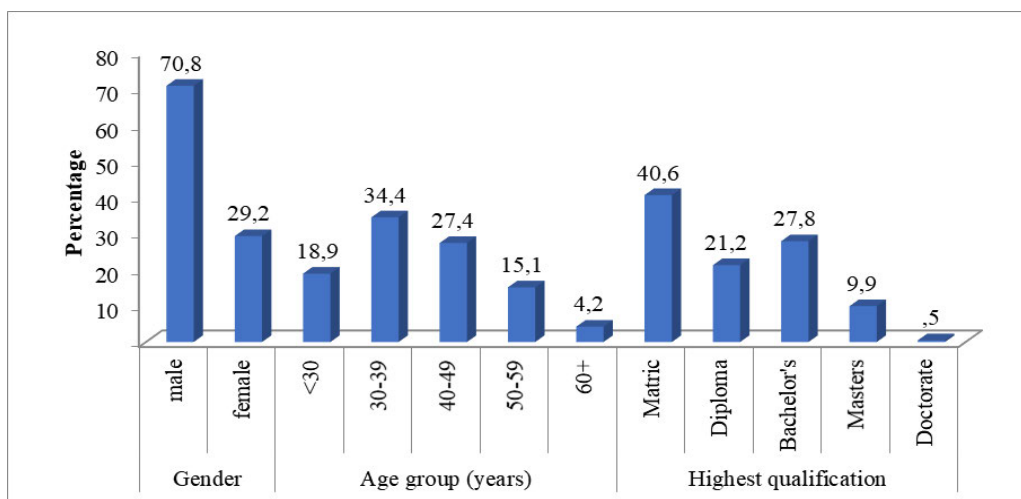


Figure 5.1: SME owners' qualifications

Source: Developed from research data

The educational profile displayed in Figure 5.2 reveals that the respondents were grouped into 13 retail industries with electronics and computing being the majority (16,5%) and the least being vehicles and transport (1.4%). The majority of the respondents had between five to ten employees (43.4%), and 27.4% of the respondents had less than five employees. The largest affected departments amongst all the SMEs that participated in the survey were the IT department (22.6%), supply chain management (21.7%) and the logistics department (21.2%).

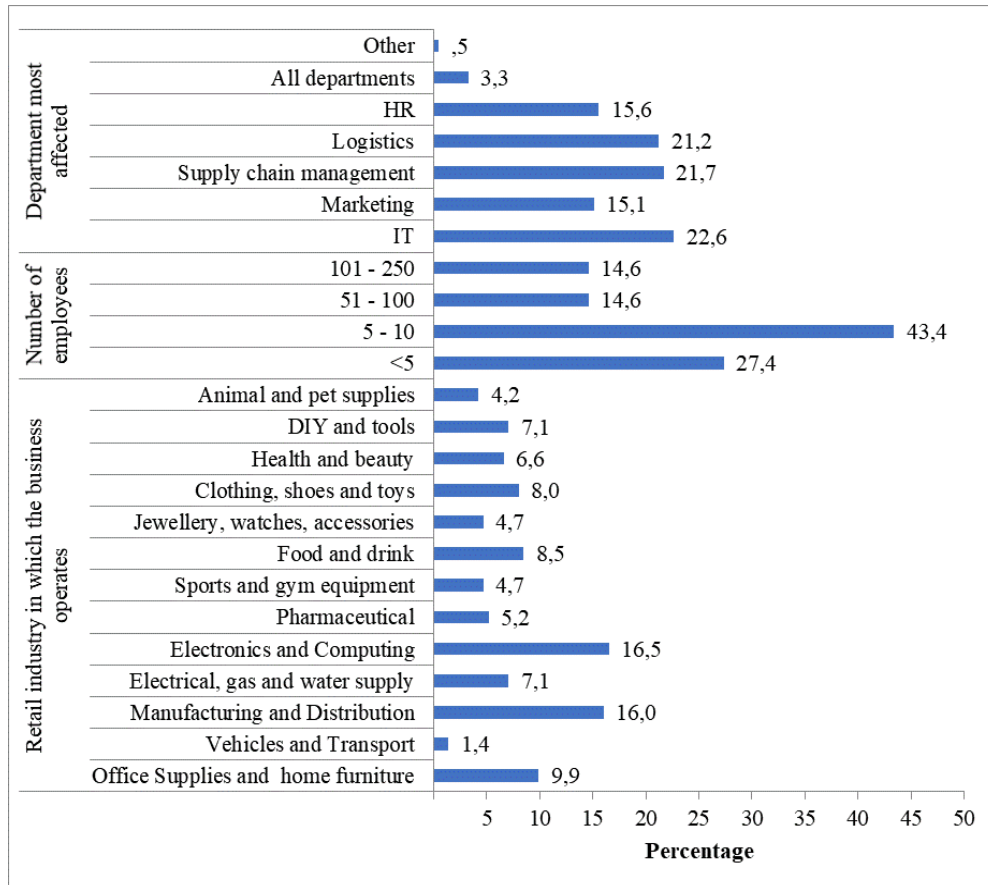


Figure 5.2: Composition of the sample

Source: Developed from research data

5.2.3. Correlations

The correlation matrix of Pearson's chi-square test of independence was utilised to examine relationships between outcomes. The p-value can be determined using the chi-square. Probability that a sample statistic will be as extreme as the test statistic is denoted by the p-value (Keller, 2006). In order to make sense of the p-value presented in Table 5.1, Keller (2006) provided the following interpretations:

Table 5.1: Describing the p-value

p-value	Significance
$p < 0.01$	Highly significant
$0.01 > p < 0.05$	Significant
$0.05 > p < 0.10$	Not statistically significant
$P > 0.10$	No significance

Source: Adapted from Keller, 2006

5.2.4. Broadband usage

Respondents were requested to rate the level of agreement in their business during the Covid-19 pandemic, using the measure 1= strongly disagree to 5 = strongly agree, to 15 items about their usage of the broadband. The responses and mean agreement scores are summarised in Table 5.2. Based on the results reported in Table 5.2, it is evident that most of the participants agreed with the usage of broadband for various activities during the pandemic.

For each section of the model, univariate analysis was used to find the pattern in the data collected and there was only one dependent variable. To each item/question, one-sample t-test was applied to test if there was significant agreement or disagreement to the item. If the mean score was greater than 3, it was interpreted as a significant agreement and if the mean score was less than 3, it was interpreted as a significant disagreement.

There was significant agreement that during Covid-19 pandemic, the internet was used for internal communications; business meetings; payments; sales; external communication with customers/suppliers; and video conferences, with the highest scores reported for sales at $M=4.64$, $SD=0.712$, $t=33.461$, $p<0.001$, and payments $M=4.40$, $SD=1.064$, $t=19.113$, $p<0.001$. There was also significant agreement with BU10, BU11, BU12, BU13 and BU14, with the highest score reported for BU13, electronic mail capabilities at $M=4.11$, $SD=1.346$, $t=11.987$, $p<0.001$. There was a significant disagreement that during the Covid-19 pandemic, the internet was used for making videos of services/products or for staff training sessions. Finally, in accordance with the interpretation and meaning of the p-value as indicated in Table 5.1, it was revealed that BU4 and BU15 were not significant at all.

Table 5.2: Results of one sample statistics for SMEs' internet usage during the pandemic

Construct	Mean (SD)	T	p-value
BU1 Internal communications	3.99 (1.513)	9.488	<.001*
BU2 Business meetings	3.66 (1.652)	5.779	<.001*
BU3 Payments	4.40 (1.064)	19.113	<.001*
BU4 Promotions	3.17 (1.749)	1.375	.171
BU5 Sales	4.64 (0.712)	33.461	<.001*
BU6 External communication with customers/suppliers	4.07 (1.399)	11.093	<.001*
BU7 Video conferences	3.50 (1.699)	4.245	<.001*
BU8 Video of products/services	2.67 (1.709)	-2.772	.006*
BU9 Staff training sessions	2.65 (1.698)	-3.033	.003*
BU10 There were direct computer-to-computer links with key suppliers	3.99 (1.419)	10.115	<.001*
BU11 Inter-organisational coordination was achieved using electronic links	3.63 (1.623)	5.629	<.001*
BU12 We used information technology-enabled transaction processing	4.06 (1.391)	11.110	<.001*
BU13 We had electronic mailing capabilities with our key suppliers	4.11 (1.346)	11.987	<.001*
BU14 We used electronic transfer of purchase orders, invoices and/or funds	4.09 (1.389)	11.419	<.001*
BU15 We used advanced information systems to track and/or expedite shipments	3.01 (1.755)	.078	.938

t -one-sample t-test statistic; df – degrees of freedom; SD- standard deviation

*indicates significance at .05 level

*N=212, df =211

Source: Developed from research data

5.2.5. Skills

Respondents were required to rate the level of agreement with ten items using the scale 1= strongly disagree to 5 = strongly agree. The results in Table 5.3 reveal that there was a significant agreement that during the Covid-19 pandemic, there were employees in their organisation who had the following skills required for digital business operations: IS1, IS2, IS3, IS7, IS8, and IS9, with the highest score being IS2 for formal internet skills, M=3.60, SD=1.610, t=5.418 and p<0.001. There was significant disagreement that during the Covid-19 pandemic, there were employees in their organisation who had the following skills required for business operations: Content writing skills and SEO skills. Lastly, in accordance

with Table 5.1, the interpretation and meaning of the p-value, it was revealed that IS4, IS5, and IS10 were not significant at all.

Table 5.3: Results of one sample statistics for SMEs’ internet skills during the pandemic

Construct	Mean (SD)	t	p-value
IS1 Operational internet skills like saving, uploading and downloading files including image, audio and video	3.49 (1.642)	4.350	<.001*
IS2 Formal internet skills like navigating through websites effectively	3.60 (1.610)	5.418	<.001*
IS3 Information internet skills like checking and retrieving information you need	3.55 (1.597)	5.030	<.001*
IS4 Strategic internet skills used to make decisions on retrieved info and financial benefits	2.89 (1.719)	-.959	.339
IS5 Soft skills such as communicating and managing staff digitally	2.81 (1.743)	-1.615	.108
IS6 Content writing skills	2.63 (1.722)	-3.151	.002
IS7 SEO skills (analyses, reviews and implements changes to websites so they are optimised for search engines)	2.53 (1.729)	-3.933	<.001*
IS8 Technical skills (ability to use a computer-based technology to complete different tasks e.g. receiving payments digitally)	3.43 (1.658)	3.770	<.001*
IS9 Using social networking tools	3.40 (1.642)	3.555	<.001*
IS10 Understanding privacy issues	2.81 (1.691)	-1.666	.097

t - one-sample t-test statistic; df – degrees of freedom; SD – standard deviation

* indicates significance at .05 level

*N=212, df= 211

Source: Developed from research data

5.2.6. E-shop features

Participants were provided with 17 items measuring features of the e-shop platform during the Covid-19 pandemic and were asked to rate their level of agreement to each one using the scale 1= strongly disagree to 5 = strongly agree. The responses are summarised in Table 5.4 below and the one sample t-tests revealed that there was significant agreement during the Covid-19 pandemic with ESF1, ESF2, ESF10, ESF12, ESF13, ESF14, with highest score for ESF13, that their business e-shop features to communicate with customers, M=3.67, SD=1.538, t=6.296, p=.000. There was a significant disagreement during the Covid-19 pandemic with ESF6, ESF10, ESF11, with the strongest disagreement being ESF 10, “Our e-shop loaded quickly”, M= 2.48, p=0.000. In accordance with the interpretation from Table

5.1 and meaning of the p-value, it was revealed that ESF3, ESF 4, ESF 5, ESF 7, ESF 8, ESF 9, ESF 15, ESF 16, ESF 17 were not significant at all.

Table 5.4: Results of one sample statistics for SMEs' e-shop features during the pandemic

Construct	Mean(SD)	t	p-value
ESF1 Our e-shop platform provided accurate information	3.62 (1.551)	5.844	.000
ESF2 The information provided on our e-shop platform was reliable	3.54 (1.546)	5.107	.000
ESF3 The information provided on our e-shop platform was clear and easy to understand	3.12 (1.630)	1.095	.275
ESF4 Our e-shop platform contained all information that was needed for the purpose of purchase decision	2.94 (1.616)	-.510	.611
ESF5 There was enough information on our website about the e-shop and its products	2.94 (1.657)	-.497	.619
ESF6 Our e-shop design was creative	2.76 (1.621)	-2.160	.032
ESF7 The start page of our e-shop easily led customers to the information they needed	2.85 (1.659)	-1.284	.201
ESF8 It was easy to move around on our e-shop platform	2.80 (1.623)	-1.778	.077
ESF9 Our e-shop platform used a good colour combination	2.79 (1.605)	-1.926	.055
ESF10 Our e-shop platform loaded quickly	2.48 (1.653)	-4.611	.000
ESF11 The transaction process on e-shop platform was easy and quick	2.59 (1.685)	-3.505	.001
ESF12 We invested time and/or money in improving the features of our e-shop	3.39 (1.615)	3.529	.001
ESF13 Our business used e-shop features to communicate with customers	3.67 (1.538)	6.296	.000
ESF14 Our business used e-shop features to share information with customers	3.65 (1.525)	6.171	.000
ESF15 Our business used e-shop features to build relationships with customers	3.19 (1.615)	1.701	.090
ESF16 Our business used e-shop features to manage customer needs	3.16 (1.630)	1.433	.153

t - one-sample t-test statistic; df – degrees of freedom; SD – standard deviation

* indicates significance at .05 level

*N=212, df =211

Source: Developed from research data

5.2.7. Digital marketing strategies

Respondents rated 11 items measuring the digital marketing strategies on a five-point Likert agreement scale, 1= strongly disagree to 5 = strongly agree. According to the results reported

in Table 5.5, there was a significant disagreement during the Covid-19 pandemic, with DMS2, DMS3, DMS4, DMS6, DMS7, DMS9, DMS10, DMS11, with the strongest disagreement being DMS9, “Our business had adequate technical support for the implementation of digital marketing activities”, with $M=2.58$, $SD=1.652$, $t=3.742$ and $p<0.001$. According to Table 5.1, with the interpretation and meaning of the p-value, it was revealed that DMS1, DMS5, and DMS8 were not significant at all.

Table 5.5: Results of one sample statistics for SMEs’ digital marketing strategies during the pandemic

Construct	Mean (SD)	T	p-value
DMS1 We had clearly defined parameters for measuring the performance of our website	2.86 (1.682)	-1.184	.238
DMS2 We knew what visitors were doing on our website	2.60 (1.648)	-3.543	<.001*
DMS3 We knew how many visitors to our website became our customers	2.75 (1.655)	-2.200	.029
DMS4 We knew what percentage of visitors came to our website through various online channels (Facebook, Google ads, display ads, search engines)	2.64 (1.650)	-3.163	.002
DMS5 We used web analytics to know which type of guests were looking for which type of product during a certain period	2.97 (1.711)	-.241	.810
DMS6 Our business had a digital marketing plan with clearly defined activities, responsible executors, and a budget for each activity	2.63 (1.654)	-3.239	.001
DMS7 Our digital marketing plan was an integral part of our marketing plan and was created using set goals	2.63 (1.657)	-3.274	.001
DMS8 We held several meetings throughout the Covid-19 pandemic to prepare a digital marketing plan	3.21 (1.691)	1.828	.069
DMS9 Our business had adequate technical support for the implementation of digital marketing activities	2.58 (1.652)	-3.742	<.001*
DMS10 People with knowledge in the field of digital marketing were responsible for the implementation of digital marketing	2.64 (1.665)	-3.176	.002
DMS11 Activities of all employees in the business, as well as external collaborators (IT experts) who were responsible for the implementation of digital marketing, were well co-ordinated	2.59 (1.668)	-3.541	<.001*

t - one-sample t-test statistic; df – degrees of freedom; SD – standard deviation

* indicates significance at .05 level

*N=212, df =211

Source: Developed from research data

5.2.8. Digital payments

There were nine items measuring digital payments on a five-point Likert scale, where 1 = strongly disagree and 5 = strongly agree. The mean scores ranged from 2.79 to 3.64. Table 5.6 reflects that there was significant agreement during the Covid-19 pandemic, with DP2, DP3, DP4, DP5, DP7, with the highest agreement with DP4, “Our digital payment sent a confirmation of payment to the customer”, M= 3.64, SD=1.562, t=5.980, p=.000. However, there was a significant disagreement during the Covid-19 pandemic, with DP2 and DP5, with strongest disagreement being DP5, “Our checkout process flow was easy and trustworthy”, with a mean of M=2.58. According to Table 5.1, with the interpretation and meaning of the p-value, it was revealed that DP1, DP6, DP8, and DP9 were not significant at all.

Table 5.6: Results of one sample statistics for SMEs’ digital payments during the pandemic

Construct	Mean(SD)	T	p-value
DP1 We accepted diverse payment methods	3.06 (1.681)	.531	.596
DP2 Our digital payment process was easy for customers of all ages and abilities to use	2.75 (1.668)	-2.141	.033
DP3 The order and delivery details of the customer were clearly stated on the payment page	3.31 (1.651)	2.704	.007
DP4 Our digital payment process sent a confirmation of payment to the customer	3.64 (1.562)	5.980	.000
DP5 Our checkout process flow was easy and trustworthy	2.58 (1.658)	-3.729	.000
DP6 Our payment form was clear and concise	2.80 (1.663)	-1.734	.084
DP7 Our digital payment process sent an automated payment invoice to the customer	3.61 (1.570)	5.686	.000
DP8 Our business monitored payment notifications and reports	2.96 (1.722)	-.319	.750
DP9 Our business implemented mobile app payments	2.79 (1.756)	-1.721	.087

t - one-sample t-test statistic; df – degrees of freedom; SD – standard deviation

* indicates significance at .05 level

*N=212, df =211

Source: Developed from research data

5.2.9. Cybercrime management

There were 12 items measuring cybersecurity on a five-point Likert scale, where 1 = strongly disagree and 5 = strongly agree. It is evident from the findings reported in Table 5.7, that there was significant agreement during the Covid-19 pandemic, CS4 and CS5, with the highest agreement being CS5, “Our IT systems had appropriate firewall and antivirus

technology”, M=3.42, and p=.000. Conversely, there was significant disagreement with the rest of the statements, with the strongest disagreement being, CS3, “Our staff was trained to recognise suspicious notifications”, M=2.54, p=.000. Reflecting on Table 5.1, the CS1 and CS2 were not significant at all.

Table 5.7: Results of one sample statistics for SMEs’ cybersecurity during the pandemic

Construct	Mean (SD)	T	p-value
CS1 Our business did regular back-ups which included files and data in general	2.85 (1.738)	-1.265	.207
CS2 Our business was aware of the data we had and the risk of having it	2.82 (1.722)	-1.555	.121
CS3 Our staff were trained to recognise suspicious notifications	2.54 (1.676)	-3.975	.000
CS4 Our business limited employee access to sensitive info	3.28 (1.724)	2.390	.018
CS5 Our IT systems had appropriate firewall and antivirus technology	3.42 (1.675)	3.657	.000
CS6 Our business had the necessary security settings in place to protect browser and email programs that met business needs without increasing risk	2.75 (1.687)	-2.163	.032
CS7 Our business had data breach security tools	2.74 (1.696)	-2.267	.024
CS8 The data breach security tools were monitored regularly	2.69 (1.708)	-2.654	.009
CS9 Our business updated security software in a timely manner	2.77 (1.703)	-1.977	.049
CS10 Our business had security capabilities to avoid attacks	2.74 (1.676)	-2.254	.025
CS11 Our business had plans in place to manage data breaches	2.73 (1.689)	-2.358	.019
CS12 Our business was protected with insurance coverage designed to address cyber risks	2.69 (1.703)	-2.628	.009

t - one-sample t-test statistic; df – degrees of freedom; SD – standard deviation

* indicates significance at .05 level

*N=212, df =211

Source: Developed from research data

5.2.10. Logistics services

The respondents were provided with six items measuring logistics services and were asked to rate their level of agreement to each one using the scale 1 = strongly disagree to 5 = strongly agree. The results in Table 5.8 reveal that there was significant disagreement during the Covid-19 pandemic, with LS2, LS3 and LS4. The strongest disagreement was LS3, “Our business always delivered at the time-slot agreed upon with the customer”, with M=2.27 and p=.000. In accordance with the interpretation and meaning of the p-value in Table 5.1, it was revealed that LS1, LS5 and LS6 were not significant at all.

Table 5.8: Results of one sample statistics for SMEs' logistics services during the pandemic

Construct	Mean(SD)	t	p-value
LS1 Our business always delivered the correct/accurate product to the customer	2.99 (1.665)	-.124	.902
LS2 Our business always delivered to the exact address/destination of the customer	2.75 (1.660)	-2.152	.033
LS3 Our business always delivered at the time-slot 4d upon with the customer	2.27 (1.539)	-6.918	.000
LS4 Our business always delivered its products in an acceptable condition	2.72 (1.622)	-2.541	.012
LS5 The correct documentation always accompanied a delivery	2.92 (1.639)	-.754	.451
LS6 Our business always delivered to the right customer	2.87 (1.653)	-1.164	.246

t - one-sample t-test statistic; df – degrees of freedom; SD – standard deviation

* indicates significance at .05 level

*N=212, df =211

Source: Developed from research data

5.2.11. Logistics management

The participants rated six items measuring the logistics management construct on a five-point Likert scale, the level of agreement to each one using the scale 1 = strongly disagree to 5 = strongly agree. According to the results shown in Table 5.9, there was significant disagreement with all the statements except for LM1 which was not significant at all. The strongest disagreement was LM6, “Information and materials flowed smoothly between our suppliers and our business”, M=2.33 and p=.000.

Table 5.9: Results of one sample statistics for SMEs' logistics management during the pandemic

Construct	Mean(SD)	T	p-value
LM1 Inter-organisational logistics activities were closely coordinated in our business	2.88 (1.651)	-1.082	.281
LM2 Our logistics activities were well integrated with the logistics activities of our suppliers	2.64 (1.613)	-3.237	.001
LM3 We had a seamless integration of logistics activities with our key suppliers	2.51 (1.589)	-4.494	.000
LM4 Our logistics integration was characterised by excellent distribution, transportation and/or warehousing facilities	2.50 (1.616)	-4.463	.000
LM5 The inbound and outbound distribution of goods with our suppliers was well integrated	2.48 (1.598)	-4.727	.000
LM6 Information and materials flowed smoothly between our suppliers and our business	2.33 (1.601)	-6.091	.000

t - one-sample t-test statistic; df – degrees of freedom; SD – standard deviation

* indicates significance at .05 level

*N=212, df =211

Source: Developed from research data

5.2.12. E-commerce growth

Respondents were provided with seven statements measuring their e-commerce growth and asked to rate their level of agreement to each one using the scale 1 = strongly disagree to 5 = strongly agree. Based on the results achieved in Table 5.10, there was a significant disagreement with all the statements, with a similar strong range of disagreement from ECG2-ECG4, M= (2.75-2.77). Additionally, in accordance with the interpretation and meaning of the p-value, it was revealed that ECG1, ECG5, ECG6, and ECG7 were not significant at all.

Table 5.10: Results of one sample statistics for SMEs' e-commerce growth during the pandemic

Construct	Mean (SD)	T	p-value
ECG1 Our business has seen a growth in online sales	2.78 (1.692)	-1.867	.063
ECG2 Our business has shown increased online profits	2.76 (1.679)	-2.086	.038
ECG3 Our business has increased its online market share	2.75 (1.678)	-2.210	.028
ECG4 Our online business revenue has increased	2.77 (1.689)	-1.993	.048
ECG5 Our business has noted a rise in the number of online transactions	2.80 (1.695)	-1.742	.083
ECG6 Our business has noted a rise in the number of online site visits	2.81 (1.657)	-1.700	.091
ECG7 Our business has recorded a decrease in online shopping cart abandonment	2.80 (1.652)	-1.746	.082

5.3. Factor analysis

In order to explore the structure of the items in each construct and validate the proposed scales of items in the model, factor analysis with Promax rotation was applied to the items in each construct. Promax rotation is an oblique rotation, which allows factors to be correlated (Mat Roni & Djajadikerta, 2021). During the process, some items were dropped either because they did not load strongly enough onto any factor or because they cross-load onto multiple factors. The reliability of combining the items into a single latent variable was tested using Cronbach's alpha. An alpha value of at least 0.7 was considered adequate. If items did not correlate strongly enough with the other items in the construct and negatively affected the reliability, they were dropped. The factor extraction was deemed to be successful

when the Kaiser-Meyer-Olkin measure of sampling adequacy exceeded 0.6, which was .949 and Bartlett's test of sphericity was significant.

i. Broadband usage

Factor analysis with Promax rotation was applied to the six items measuring the broadband usage. During the process, item BU15 was dropped because it loaded too low on the factor and did not correlate high enough with the other items. A summary of the results from the factor analysis (Table 5.11) showed that one factor was extracted which accounted for 68.01% of the variance in the data.

ii. Skills set

Factor analysis with Promax rotation was applied to the ten items measuring the skills set. During the process, item IS8 was dropped because it cross loaded. Table 5.11 reveals that two factors were extracted which accounted for 78.47% of the variance in the data.

iii. E-shop features

Factor analysis was conducted once again with Promax rotation to the 17 items measuring e-shop features. During the process, item ESF12 was dropped because it cross loaded. Table 5.11 reveals that two factors were extracted which accounted for 80.40% of the variance in the data.

iv. Digital marketing strategies

Table 5.11 reveals that one factor was extracted which accounts for 80.60% of the variance in the data.

v. Digital payments

During the process of factor analysis, items DP3, DP4 and DP7 were dropped because they loaded too low on the factor and did not correlate high enough with the other items. Table 5.11 shows that one factor was extracted which accounts for 75.70% of the variance in the data.

vi. Cyber security

A summary of the results from factor analysis showed that one factor was extracted which accounts for 79.58% of the variance in the data.

vii. Logistics services

Table 5.11 reveals that one factor was extracted which accounts for 75.48% of the variance in the data.

viii. Logistics management

A summary of the results in Table 5.11 shows that one factor was extracted which accounts for 86.23% of the variance in the data.

ix. E-commerce growth

Table 5.11 indicates that one factor was extracted which accounts for 98.04% of the variance in the data.

Table 5.11: Initial factor loadings

Construct	Factor		Cronbach's alpha	Variance extracted (%)	Kaiser-Meyer-Olkin measure of sampling adequacy	Bartlett's test – p-value
	1	2				
Broadband usage						
BU13	.858		.912	68.01	.865	710.347 (<.001)
BU10	.846					
BU12	.814					
BU14	.813					
BU11	.790					
Internet skills						
IS7	.977		.943	66.28	.869	2129.244 (<.001)
IS6	.975					
IS10	.859					
IS5	.838					
IS4	.784					
IS9	.474					
IS2		.986	.943	12.19		
IS3		.906				
IS1		.839				
e-Shop						
ESF9	.949		.977	71.93	.933	5268.933 (<.001)
ESF11	.947					
ESF10	.943					
ESF8	.927					
ESF7	.923					
ESF6	.919					

Construct	Factor		Cronbach's alpha	Variance extracted (%)	Kaiser-Meyer-Olkin measure of sampling adequacy	Bartlett's test – p-value
	1	2				
ESF5	.861		.956	8.47		
ESF4	.810					
ESF3	.617					
ESF14		1.009				
ESF13		.947				
ESF1		.855				
ESF2		.767				
ESF17		.649				
ESF16		.646				
ESF15	.351	.601				
Digital marketing strategies						
DMS6	.953		.978	80.60	.945	3733.726 (<.001)
DMS7	.951					
DMS2	.944					
DMS9	.943					
DMS10	.939					
DMS11	.932					
DMS4	.912					
DMS1	.906					
DMS3	.853					
DMS5	.817					
DMS8	.689					
Digital payments						
DP2	.910		.949	75.70	.907	1226.673 (<.001)
DP6	.909					
DP5	.881					
DP8	.875					
DP9	.847					
DP1	.793					
Cyber security						
CS10	.964		.978	79.58	.932	4483.731 (<.001)
CS8	.962					
CS6	.957					
CS11	.955					
CS7	.953					
CS9	.947					
CS12	.909					

Construct	Factor		Cronbach's alpha	Variance extracted (%)	Kaiser-Meyer-Olkin measure of sampling adequacy	Bartlett's test – p-value
	1	2				
CS3	.886					
CS1	.863					
CS2	.863					
CS4	.696					
CS5	.688					
Logistics services						
LS6	.926		.947	75.18	.884	1270.705 (<.001)
LS2	.898					
LS5	.875					
LS4	.871					
LS1	.859					
LS3	.765					
Logistics management						
LM5	.971		.973	86.23	.908	1974.092 (<.001)
LM3	.962					
LM4	.953					
LM2	.925					
LM6	.923					
LM1	.831					
E-commerce growth						
ECG1	.995		.997	98.04	.881	5338.295 (<.001)
ECG4	.995					
ECG2	.992					
ECG5	.991					
ECG3	.987					
ECG7	.986					
ECG6	.985					

Source: Developed from research data

The analysis revealed that the measures, when taken independently, are strong scales with good reliability. In order to ensure construct validity (convergent validity and discriminant validity), factor analysis with Promax rotation was applied to all these items at the same time. The items, CS5, CS4, ESF3, and IS5, cross-loaded and were then dropped. The initial results then showed that logistics services and logistics management were clearly highly correlated and could not be separated with all 12 items loading together onto a single factor.

Constructs needed to be dropped since they did not make theoretical sense to be combined and clearly were inseparable. Specifically, the constructs cybersecurity, digital payments (DP) and digital marketing strategies (DMS) could not be separated but theoretically were not measuring the same thing and therefore could not all be retained.

The researcher revisited the proposed model and the theory behind these constructs, and it seemed sensible to drop the variables CS and DMS which previously were moderating variables. Instead of having four different moderating variables, the variable digital skills (IS), which still represented the dynamic capabilities, would be the moderator for all the independent variables. This is supported by the resource-based theory and dynamic capabilities theory. In addition, logistics services and logistics management would be joined to a single independent variable called logistics. From the original items loading together onto the first factor, those measuring digital payments (DP) were retained, as this was deemed the most important construct to keep in terms of the proposed model. The items that were retained for the final model included: BU 10 – 14; IS 1-3, 8,9; ESF 1-2, 13-17; DP 1,2,5,6,8,9; LS 1-6; LM 1-6; and ECG 1-7. After applying these choices, factor analysis was conducted once again.

Table 5.12: Initial solution for confirmatory factor analysis

	Factor					
	1	2	3	4	5	6
LS6	1.050					
LS5	.934					
LS2	.865					
LM2	.856					
LS1	.852					
LS4	.841					
LM5	.819					
LM1	.789					
LM3	.763					
LM4	.751					
LM6	.745					
LS3	.666					.431
ECG4		.939				
ECG1		.918				
ECG5		.916				
ECG2		.906				
ECG6		.902				
ECG7		.900				
ECG3		.895				
ESF14			.852			
ESF17			.844			
ESF16			.843			
ESF15			.828			

	Factor					
	1	2	3	4	5	6
ESF13			.827			
ESF1			.693			
ESF2			.570			
BU12				.827		
BU13				.805		
BU10				.789		
BU11				.756		
BU14				.731		
IS2					.895	
IS3					.831	
IS1					.829	
IS8			.325		.509	
IS9					.446	
DP5						.767
DP2						.667
DP6						.636
DP8						.608
DP9			.408			.593
DP1						.322
Cronbach's alpha	.976	.997	.956	.912	.912	.949
Variance extracted (%)	53.87	12.96	5.57	3.61	2.88	1.83
Kaiser-Meyer-Olkin	.938					
Bartlett's test – p-value	15480.095 (<.001)					

Source: Developed from research data

5.4. Testing the model

The researcher used two stages in conducting SEM. In the first phase, the researcher focused on finding the measurement model. At this point, a confirmatory factor analysis (CFA) was performed to investigate the measurable latent constructs through corresponding measured variables. Adjustments were made to the latent constructs in which some measured variables were dropped. This process was done in order to achieve reliability and construct validity, which entailed both convergent and discriminant validity. In the second phase, the researcher transformed the measurement model discovered in the first stage into a path model revealing the interrelationships of the latent variables. After developing the path model, the researcher examined how the various independent variables affected the dependent variable.

5.4.1. Measurement model

Table 5.12 above showed all the variables in the initial stage as well as variables which were retained in the final model. It revealed factor loadings from the initial measurement model and then from the final measurement model once items were dropped to attain validity and reliability as well as to get an acceptable model fit. The composite reliability of a set of indicators for a common factor was defined as the degree to which those indicators showed

a common pattern of variation. All loadings must be greater than 0.5, and CR must be greater than 0.7, for reliability to be attained. The threshold for convergent validity is when the CR is larger than AVE, and the AVE is larger than 0.5. Indicating the degree to which one construct differs from others is known as its discriminant validity. The Fornell-Larcker criterion was utilised to evaluate discriminant validity. As the AVE values for all constructs were greater than 0.5 and the AVE values for all constructs were greater than the highest squared correlations among constructs, the test provided support for the discriminant validity of the variables. All indicator loadings for all variables were statistically significant (p 0.01), lending credence to the reliability, and well above the recommended composite reliability threshold of 0.70. For discriminant validity to be achieved, AVE must be greater than MSV.

As seen in the Tables below for the measurement models, the initial measurement model, had to drop a few items in order to reach an acceptable model fit. These included: ESF1 ESF 2 IS8 IS9 ECG3 and ECG5. These were all removed because they had unacceptably high standardised residual covariance values which caused the model fit to be unacceptable.

Based on the results achieved and listed in Table 5.13 below, it can be concluded that reliability, convergent and discriminant validity were all achieved for both initial and final loadings for the broadband construct.

Based on the requirements mentioned above, Table 5.14 below shows that it can therefore be concluded that reliability, convergent and discriminant validity were all achieved for both initial and final loadings for the e-shop features construct.

Table 5.13: Measurement model for broadband usage

CONSTRUCT	Measured variables	Loadings	
		Initial	Final
Broadband usage	BU10 There were direct computer-to-computer links with key suppliers	0.854	0.854
	BU11 Inter-organisational coordination was achieved using electronic links	0.803	0.803
	BU12 We used information technology-enabled transaction processing	0.795	0.794
	BU13 We had electronic mailing capabilities with our key suppliers	0.857	0.858
	BU14 We used electronic transfer of purchase orders, invoices and/or funds	0.811	0.81
Composite reliability (CR)		0.914	0.914
Average variance extracted (AVE)		0.68	0.679
Maximum shared square variance (MSV)		0.489	0.483

Source: Developed from research data

Table 5.14: Measurement model for e-shop platform

CONSTRUCT	Measured variables	Loadings	
		Initial	Final
E-shop features	ESF1 Our e-shop platform provided accurate information	0.758	
	ESF2 The information provided on our e-shop platform was reliable	0.721	
	ESF13 Our business used e-shop features to communicate with customers	0.718	0.695
	ESF14 Our business used e-shop features to share information with customers	0.738	0.718
	ESF15 Our business used e-shop features to build relationships with customers	0.95	0.948
	ESF16 Our business used e-shop features to manage customer needs	0.985	0.989
	ESF17 Our business used e-shop features to feel close to customers	0.977	0.979
Composite reliability (CR)		0.944	0.941
Average variance extracted (AVE)		0.712	0.767
Maximum shared square variance (MSV)		0.567	0.548

Source: Developed from research data

According to the results shown in Table 5.15 below, the digital payments construct reached all the specifications to be reliable and valid.

Table 5.15: Measurement model for digital payments

CONSTRUCT	Measured variables	Loadings	
		Initial	Final
Digital payments	DP1 We accepted diverse payment methods	0.808	0.807
	DP2 Our digital payment process was easy for customers of all ages and abilities to use	0.909	0.922
	DP5 Our checkout process flow was easy and trustworthy	0.883	0.884
	DP6 Our payment form was clear and concise	0.913	0.915
	DP8 Our business monitored payment notifications and reports	0.865	0.849
	DP9 Our business implemented mobile app payments	0.842	0.843
Composite reliability (CR)		0.949	0.95
Average variance extracted (AVE)		0.758	0.759
Maximum shared square variance (MSV)		0.599	0.588

Source: Developed from research data

The results obtained in Table 5.16 revealed that reliability, convergent and discriminant validity were all achieved for both initial and final loadings for the logistics construct.

Table 5.16: Measurement model for logistics

CONSTRUCT	Measured variables	Loadings	
		Initial	Final
Logistics	LS1 Our business always delivered the correct/accurate product to the customer	0.765	0.77
	LS2 Our business always delivered to the exact address/destination of the customer	0.847	0.846
	LS3 Our business always delivered at the timeslot 4d upon with the customer	0.851	0.852
	LS4 Our business always delivered its products in an acceptable condition	0.863	0.863
	LS5 The correct documentation always accompanied a delivery	0.774	0.775
	LS6 Our business always delivered to the right customer	0.801	0.819
	LM1 Inter-organisational logistics activities were closely coordinated in our business	0.848	0.85
	LM2 Our logistics activities were well integrated with the logistics activities of our suppliers	0.917	0.911
	LM3 We had a seamless integration of logistics activities with our key suppliers	0.956	0.949
	LM4 Our logistics integration was characterised by excellent distribution, transportation and/or warehousing facilities	0.95	0.952
	LM5 The inbound and outbound distribution of goods with our suppliers was well integrated	0.965	0.965
	LM6 Information and materials flowed smoothly between our suppliers and our business	0.927	0.93
	Composite reliability (CR)		0.975
Average variance extracted (AVE)		0.765	0.767
Maximum shared square variance (MSV)		0.638	0.638

Source: Developed from research data

Table 5.17 shows that the factor loadings revealed and concluded that reliability, convergent and discriminant validity were all achieved for both initial and final loadings for the internet skills construct.

Table 5.17: Measurement model for skills set

CONSTRUCT	Measured variables	Loadings	
		Initial	Final
Internet skills	IS1 Operational internet skills like saving, uploading and downloading files including image, audio and video	0.874	0.881
	IS2 Formal internet skills like navigating through websites effectively	0.94	0.946
	IS3 Information internet skills like checking and retrieving information you need	0.935	0.936
	IS8 Technical skills (ability to use a computer-based technology to complete different tasks e.g. receiving payments digitally)	0.7	
	IS9 Using social networking tools	0.626	
Composite reliability (CR)		0.913	0.944
Average variance extracted (AVE)		0.728	0.849
Maximum shared square variance (MSV)		0.489	0.483

The loadings from Table 5.18 showed that this construct achieved was well within the range of being reliable and valid.

Table 5.18: Measurement model for e-commerce growth

CONSTRUCT	Measured variables	Loadings	
		Initial	Final
E-commerce growth	ECG1 Our business has seen a growth in online sales	0.996	0.996
	ECG2 Our business has shown increased online profits	0.995	0.996
	ECG3 Our business has increased its online market share	0.99	
	ECG4 Our online business revenue has increased	0.997	0.997
	ECG5 Our business has noted a rise in the number of online transactions	0.99	
	ECG6 Our business has noted a rise in the number of online site visits	0.979	0.975
	ECG7 Our business has recorded a decrease in online shopping cart abandonment	0.98	0.978
Composite reliability (CR)		0.997	0.995
Average variance extracted (AVE)		0.979	0.977
Maximum shared square variance (MSV)		0.638	0.638

Source: Developed from research data

5.5. Model fit indices

An index of fit examines how well observed data fits a particular probability distribution (Yuan, 2005). An index of fit is typically normalised, which means that certain units of

measurement are removed, and the values will usually be between 0 and 1. It was noted that the model fit was an issue in the initial solution; however, all was acceptable for final solution and therefore, the final measurement model was accepted. As shown in Table 5.19, four model fitness indices were used to measure the model fit. By dividing chi-squared by the number of degrees of freedom, the normed chi-square is obtained, which is an absolute fit index. A value of less than 5 (<5) was suggested by Kenny (2015) as the minimum value for the acceptable coefficient. According to Newsom (2017), IFI is a relative fit index compared with the chi-square value ratios of the tested model by those of the baseline model. The IFI value was suggested by Hu and Bentler (1999) to be >0.9. According to Newsom (2017), the comparative fit index (CFI) evaluates model fitness by contrasting the measurement model's chi-square values with those of the baseline model. The minimum acceptable value was set by Ding et al. (1995) to be >0.9. The root mean square error of approximation is the ultimate fit index used because it evaluates how well the measurement model fits the population covariance matrix (Newsom, 2017). It is suggested that the root mean square error of approximation value falls in the range of 0.05 and 0.08 (Iacobucci, 2010). With a good fit to the data, the final model seems to be valid. This final, approved model was then advanced to the path analysis phase of SEM.

Table 5.19: Summary of the model fit indices

Fit Indices	Fit values		Criteria
	Initial model	Final model	
χ^2 / df (p-value)	4.471 (<.001)	2.313 (<.001)	<5
IFI	0.824	0.942	>.9
CFI	0.823	0.942	>.9
RMSEA	0.128	0.079	<.08

Source: Developed from research data

5.6. Moderation effect

Examining the moderating effect of a third factor on the connection between a set of independent and dependent variables is called moderation. There are several ways to deal with the moderations (interactions) in research. The first option could be to do the analysis using the latent variables and measured items for all constructs including the interactions. While this is possible, there are limitations given the large numbers of measured variables in some of the constructs. This large number that would be multiplied when forming interactions could have a negative effect on the model fit. Matched pairs method could solve

this issue; however, while that could work for this model, one could lose too much information from the measured variables and therefore the researcher did not pursue that method.

The second option could be to convert all latent variables to measured variables by calculating the average of the items in that variable. Then form the interactions and proceed with moderation testing using a path analysis approach to SEM. In this case, the researcher could have lost information and thus hesitated to use this unless absolutely necessary.

The third option was to leave the model constructs as latent variables with their measured variables. However, for the interactions, it is necessary to form measured variables instead of latent variables. So, this is a mix of the two methods described above. This is the method the researcher used as it provided usable and meaningful results.

The analysis of the structural model was first presented without the added moderation variable and interactions. Thereafter, the necessary variables were added to test the moderation and the stages of the moderation analysis were then presented.

5.7. Hypothesis testing

The hypothesis testing started with the four independent variables which were tested with the dependent variable.

H1: Broadband usage positively influenced the growth of e-commerce among SMEs during the Covid-19 pandemic.

Results from the analysis of the model using structural equation modelling (SEM) indicate the path from broadband to e-commerce growth was not significant, with $p=0.842$. Therefore, the hypothesis was rejected, and it was concluded that there is no significant positive relationship between broadband usage and e-commerce growth.

H3: Features of the e-shop platform positively impacted the growth of e-commerce among SMEs during a Covid-19 pandemic.

According to the results from the analysis, the path from the e-shop features to the e-commerce growth was not significant, with $p=0.139$. Therefore, the hypothesis was rejected, and it was concluded that there is no significant positive relationship between e-shop features and e-commerce growth.

H5: Digital payment systems influenced the growth of e-commerce among SMEs during the Covid-19 pandemic.

According to the findings from the analysis, the path from digital payments to e-commerce growth was significant, with $p < 0.001$. Therefore, the hypothesis was accepted, and it was concluded that there is a significant positive relationship between digital payments and e-commerce growth.

H7: Efficient logistics positively impacted the growth of e-commerce among SMEs during the pandemic.

The results from the analysis indicate that the path from logistics and e-commerce growth was significant, with $p < 0.001$. Therefore, the hypothesis was accepted, and it was concluded that there is a significant positive relationship between logistics and e-commerce growth.

Table 5.20: Structural model without the moderation

Independent variable	→ Dependent variable	Regression coefficient	p-value
ESF	ECG	-0.092	.139
BU	ECG	0.010	.842
DP	ECG	0.478	<.001
LOG	ECG	0.502	<.001

Source: Developed from research data

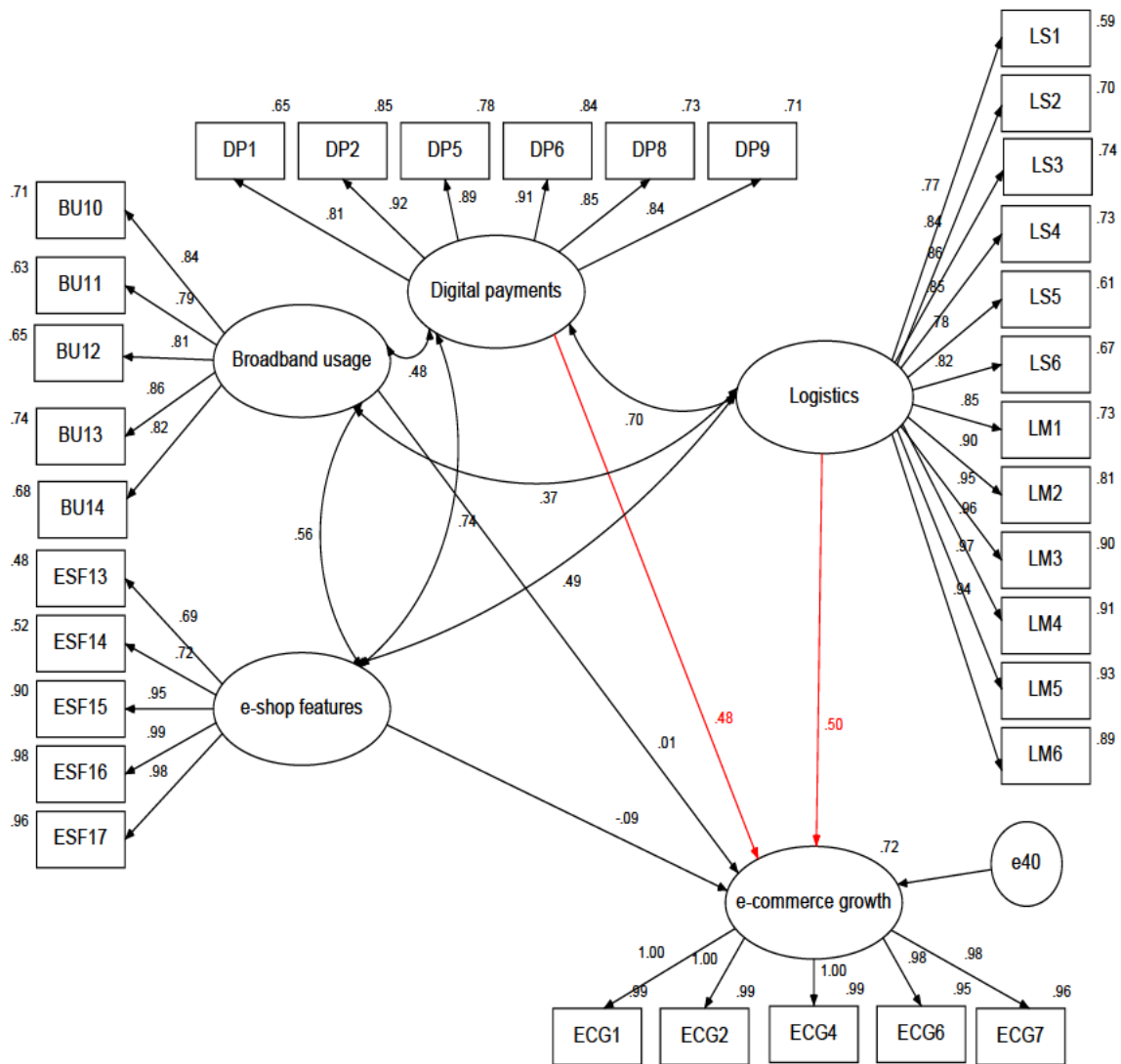


Figure 5.3: SEM without moderation
 Source: Developed from research data

5.8. Testing the impact of the moderating variable

The process that followed to prepare the data for the moderation was, firstly, all the measured items for the four independent variables and moderator variable were standardised. Secondly, for each of the four independent variables, composite and moderator variables were formed by calculating the average of the standardised items within the construct. Thirdly, the interaction variables that were formed were as follows: for each independent variable (IV), Z, and the moderator, M, the interaction term was calculated as $Z * M$, and lastly, these interaction variables were then added to the model (as shown in Figure 5.4 below). The interactions were then added together with the moderating variable and the model was tested. If any interaction was not significant, it was dropped, and the model was rerun. The researcher selected the interaction that was ‘worst’, which meant furthest from

being significant, and dropped it, one at a time. This was repeated until any interactions that remained were significant. Following this process, Figure 5.4 below reflects the SEM with the moderator variable. Figure 5.4 depicts all the paths based on the SEM that were done to assess the theoretical underpinnings of the study and the significance of the relationships between the conceptual model components to corroborate the hypotheses tested.

H8: Skills moderated the relationship between logistics services and the growth of e-commerce among SMEs during the pandemic.

Table 5.21 results showed that the interaction between skills (IS) and logistics (Anim-Yeboah et al.) was not significant and showed the lowest significance (highest p value) and was dropped from the model. Therefore, it was concluded that skills (IS) do not moderate the effect of LOG on e-commerce growth (ECG) and this hypothesis was rejected.

Table 5.21: Step 1: Full model with four interactions

Independent variable →	Dependent variable	Regression coefficient	p-value
ESF	ECG	-.116	.054
BU	ECG	.113	.113
DP	ECG	.569	<.001
LOG	ECG	.454	<.001
IS	ECG	-.188	<.001
ISxBU	ECG	.071	.213
ISxESF	ECG	.031	.627
ISxDP	ECG	-.193	.049
ISxLOG	ECG	.020	.802

Source: Developed from research data

H4: Skills moderated the relationship between the e-shop platform and the growth of e-commerce among SMEs during the Covid-19 pandemic.

Table 5.22 results showed that the interaction between IS and (e-shop features) ESF was not significant and revealed the lowest significance (highest p value) and was dropped from the model. It was concluded that IS does not moderate the effect of ESF on ECG and this hypothesis was rejected.

Table 5.22: Step 2: Revised model with three remaining interactions

Independent variable	Dependent variable	Regression coefficient	p-value
ESF	ECG	-.116	.056
BU	ECG	.116	.105
DP	ECG	.563	<.001
LOG	ECG	.465	<.001
IS	ECG	-.191	<.001
ISxBU	ECG	.074	.192
ISxESF	ECG	.033	.608
ISxDP	ECG	-.184	.006

Source: Developed from research data

H2: Skills set moderated the relationship between broadband and the growth of e-commerce during the Covid-19 pandemic.

These results revealed that the interaction between IS and broadband usage (BU) was not significant and revealed a low significance (highest p value) and was dropped from the model. It was concluded that IS does not moderate the effect of BU on ECG and this hypothesis was rejected.

Table 5.23: Step 3: Revised model with 2 remaining interactions

Independent variable	Dependent variable	Regression coefficient	p-value
ESF	ECG	-.113	.059
BU	ECG	.116	.094
DP	ECG	.562	<.001
LOG	ECG	.461	<.001
IS	ECG	-.190	<.001
ISxBU	ECG	.084	.119
ISxDP	ECG	-.168	<.001

Source: Developed from research data

H6: Skills moderate the relationship between digital payments and the growth of e-commerce among SMEs during a pandemic.

These results showed that the interaction between IS and digital payments (DP) was significant and revealed a high significance (low p value). It was concluded that IS does moderate the effect of DP on ECG and this hypothesis was accepted.

Table 5.24: Step 4: Revised model with 1 remaining interactions

Independent variable	Dependent variable	Regression coefficient	p-value
ESF	ECG	-.088	.116
BU	ECG	.039	.426
DP	ECG	.543	<.001
LOG	ECG	.459	<.001
IS	ECG	-.148	.002
ISxDP	ECG	-.115	.005

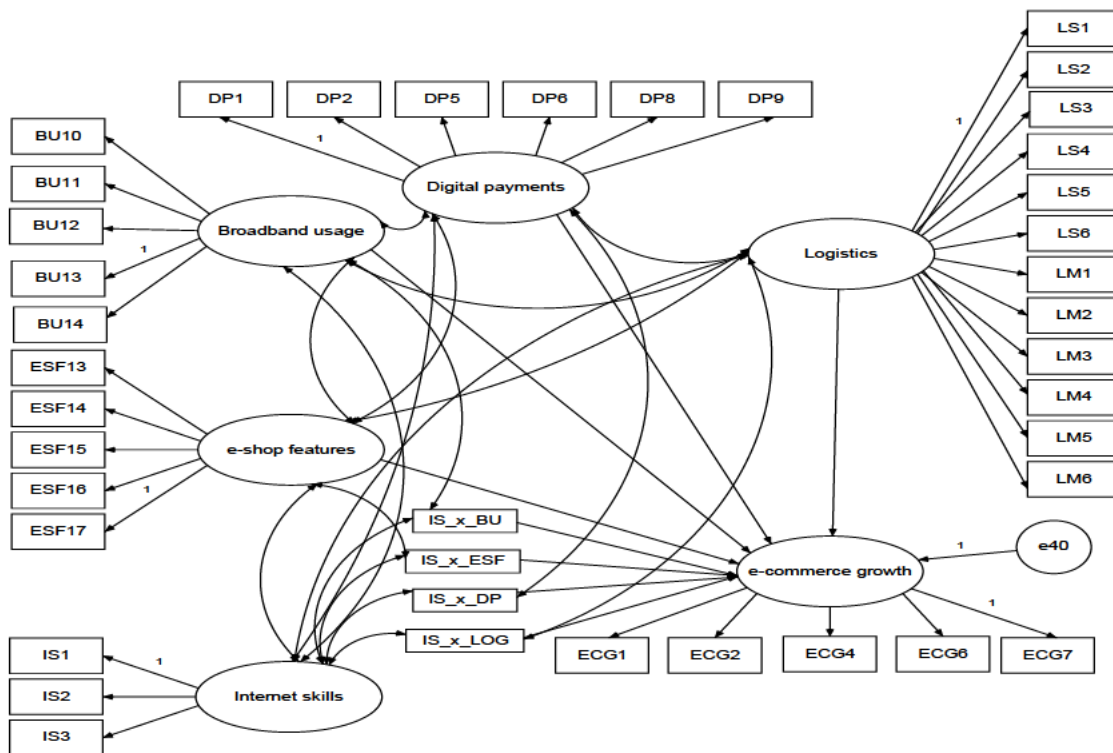


Figure 5.4: The SEM with the moderator variables

Source: Developed from research data

Figure 5.5 below is a graphical representation of the moderating effect of skills between digital payments and e-commerce growth. This graph shows that a high DP positively affects ECG (as seen above with the positive and significant coefficient of .543). However, at low DP, IS does not have an effect on the relationship between DP and ECG. Conversely, at high DP: low IS has a greater effect on the relationship between DP and ECG than when skills

(IS) is high. This result basically is interpreted as, the lower the level of internet skills, the stronger a relationship between DP and ECG.

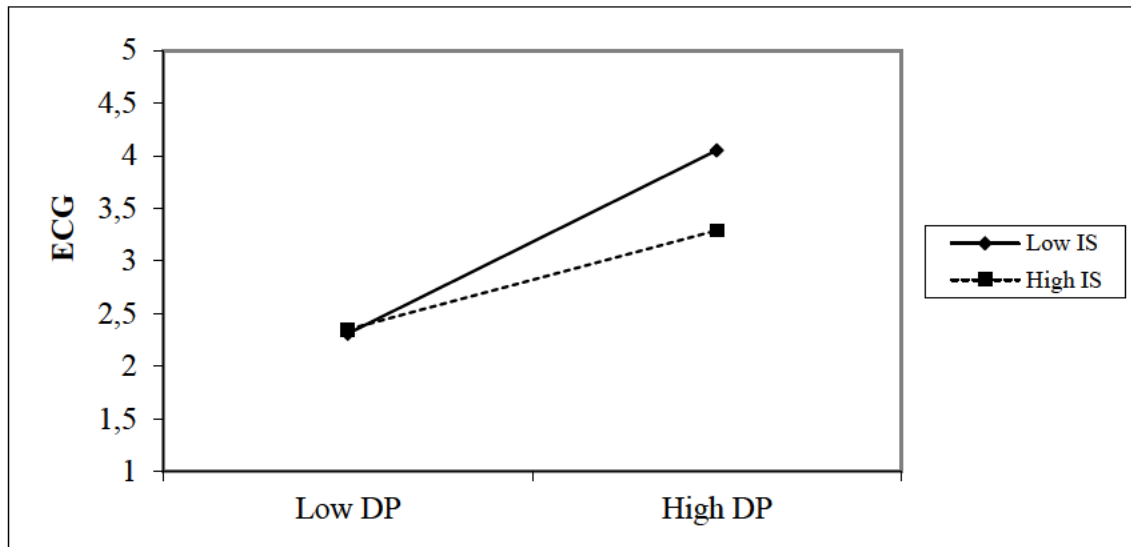


Figure 5.5: Graphical representation of the moderating effect

Source: Developed from research data

5.9. Summary of the findings from the survey

This section presented the results of the hypotheses tests using structural equation model to determine the impact of Covid-19 on e-commerce among SMEs in Gauteng. The theoretical model proposed was tested using confirmatory factor analysis as a measurement model to establish the validity and reliability of the structural model. Results from the CFA were used to modify the model to improve the model fit. The initial model was tested statistically and had to be readjusted to achieve the model fit. After establishing the reliability of the structural model, regression analysis was then used to test the research hypotheses. Based on the results obtained from the final adjusted model, the regression analysis revealed that three hypotheses were accepted and five were rejected. Furthermore, the moderating effect was significant between the relationship of digital payments and e-commerce growth.

The qualitative research findings and analysis are discussed next.

5.10. Qualitative research findings

The structure of this section is as follows: the description of the interviewees, and the coding scheme used to conduct the analysis. The findings provide deeper insight into the participating companies' experiences during the Covid-19 pandemic, with a focus on

broadband/internet, the e-shop platform, digital payments, logistics services, and e-commerce growth.

5.10.1. Demographic profile of interviewees

Semi-structured interviews were conducted with 13 SME owners regarding the experiences and challenges with using e-commerce during the Covid-19 pandemic. All the participants volunteered to be part of the study and the interviews were conducted face-to-face and some online via Zoom. The interview duration was between 10 to 27 minutes long, with an average being 15 minutes. The participants were in retail industries with either a hybrid or an online only business. All the participants were over the age of 40 years, except for the participant from company A, with the owner aged 37. Most of the participants were SME owner/managers.

Table 5.25: Demographics of interviewees

Company	Business activity	Age	Duration of interview in minutes	Qualifications
Retail sector				
Company A Manufacturing and distribution (hybrid)	We are an online cleaning equipment company we supply and manufacture cleaning equipment for the bottling industry and a particularly your foam cleaning systems	37	14.06	Matric
Company B Distribution (hybrid) it is a company where we resell dehydrated honey powder which is a liquid honey which has been dehydrated and we resell that's whether it's in bulk or in individual pouches.	54	18.59	Matric
Company C Manufacturing and distribution (hybrid)	... is automotive which is mainly production lines when we supply Ford Mercedes BMW and also scaffolding industry will also heavily focus to a list extended though in the merchant's market and we are the to go people where comes to specialize material online became really big since the pandemic started.	50	21.59	Diploma
Company D Retail cleaning supplies (hybrid)	...we basically supply a wide range of quality cleaning, disinfecting and sanitizing products to consumers	50	09.05	Matric

Company Retail sector	Business activity	Age	Duration of interview in minutes	Qualifications
Company E Retail electrical supplies (hybrid)	we started our website back in 2015 and obviously has to adapt during the pandemic with the increase of traffic loads, ...	45	21.21	Grade 9
Company F Retail (online store only)	... sourcing of appliances TVs etc. for friends and family and realized that this could be a business and that's when I started my shopper. ..online was something that was picking up at the time so I started doing online and started promoting my business online and its active and still running...	42	27	Wits honours degree in IT
Company G Retail PPE and office supplies (hybrid)	... we Supplier Personal Protective Equipment, Stationery and Office Supplies. We have an online store as well which was started years before Covid-19.	41	11.06	N/a
Company H Retail consumer electronics (Hybrid)	... able to offer our customers a remarkable range of audio, visual and photographic equipment from the major brand importers.	55	8.20	Masters
Company I Retail metal products (hybrid)	... produce and sell metal products online and instore, my business prior Covid was 60/40online but is now 50/50 after the pandemic.	48	14.38	Matric
Company J Retail battery supply (Online)	...online and mortar power supply business which specializes in batteries. My business was majority face to face before covid, with a small online presence, but after covid my business is mainly online.	46	12.54	Matric
Company K Retail steel products (hybrid)	... Steelworld is a dynamic and innovative steel manufacturing company ... Our team of in-house experts oversees production of our comprehensive product range which includes machine parts, truck and trailer components.	46	11.40	Matric
Company L Retail online store	... importer and distributor based in Johannesburg, South Africa... excels in sourcing, importing, and distributing primarily electronics products into South Africa...	65	11.38	BCom Degree

Company Retail sector	Business activity	Age	Duration of interview in minutes	Qualifications
Company M Retail online Store	...We supply electronics, TV's, small appliances, and large appliances... is the largest independent, electronic, appliance and furniture buying group in South Africa...	50	7.33	CA

Source: Developed from research data

5.10.2. Extraction of themes

Following the transcription of the interviews, the information was categorised into themes based on the recurrence of words and phrases. To locate and compile all the text and other material related to the research questions, data was coded and organised to pinpoint specific relationships between data categories and subcategories (Braun & Clarke, 2006). Microsoft excel was used to organise the data in a systematic way and themes were then extracted (Bree & Gallagher, 2016).

In the parts that follow, the themes are listed under the corresponding objective and interview questions. Findings in line with Objective 5 are presented with each of the objectives from 1 to 4 according to the interview questions.

5.10.3. Objective 1: To critically analyse the impact of broadband usage on the growth of e-commerce among SMEs during the Covid-19 pandemic

The token ratio was 0.402, indicating that there was less variability in the choice of words used by the participants. In this sense, it can be said that the words that were used converged around similar ideas.

After reviewing the pattern of text used, and the context in which the text was used, sub-themes as illustrated in Figure 5.6 emerged. In fact, Figure 5.6 illustrates the issues in relation to broadband/internet that were discussed, namely the type of internet connection, internet challenges during pandemic, internet skills, importance of e-commerce and the impact of the challenges on the business.

- **Type of connection**

From Table 5.26 below, it can be noted that most of the companies used Wi-Fi as their internet connection.

Table 5.26: Summary of participants' internet connection

Company	Type of connection
Company A	Wi-Fi
Company B	We use a Wi-Fi modem via Telkom with a just a normal capped data contracts packages that we have with Telkom
Company C	Wi-Fi Vodacom
Company D	ADSL
Company E	so, we were using an ADS online with connected up to a router and then with a wireless of a Wi-Fi signal
Company F	so, I was using the fibre connection and I was using a Wi-Fi router at times when there's no signal
Company G	Wi-Fi
Company H	Wi-Fi
Company I	5G
Company J	Wi-Fi
Company K	Wi-Fi
Company L	Wi-Fi
Company M	Wi-Fi

Source: Developed from research data

- **Challenges experienced with broadband during the pandemic**

Participants were asked about the challenges they faced during the pandemic. All participants indicated facing some challenges, and a specimen of the challenges are as illustrated by the extracts below.

Shew we've had many challenges with the Internet and that is due to the pandemic was something that was new to everyone it was something that shook the world so no one was prepared for it so service delivery of the Internet especially was something that was impact at the most and us as businesses we've paid the brunt of it due to everyone working at home and domestic Internet usage was higher which means Speeds were throttled and businesses bear the brunt of it (Company A).

By saying “*everyone working at home and domestic internet usage was higher which means Speeds were throttled and businesses bear the brunt of it*”, the participant is drawing attention to challenges encountered when businesses migrated from the offline to the online environment. No one was prepared for higher internet usage, and this had adverse effects on the business. This view is reinforced by a participant from Company D who had this to say:

It was unbelievable. It was so sad because that was our only form of communication and sales during the pandemic, and we had no joy at all using the internet. From the service providers being down, the staff working at the service providers were working from home and when you called, they just had bad attitudes and didn't care that the server was down. No help from them at all. We actually ended up upgrading our package to have a better experience and still never made a single difference. It was truly a nightmare (Company D)

By saying “*we had no joy at all using the internet*”, the participant is highlighting the gravity of the challenges that they encountered. The response when “*the server was down*” was not satisfactory, and this affected the operational activities. At times, firms were left to find their own solutions when the experts ignored their calls for help. By saying “*it was truly a nightmare*”, the participant is amplifying the gravity of the challenges whereby there was no help at all when needed, and this had adverse effects on the business activities. In this vein, a participant from Company E, had this to say:

we definitely face challenges you see with the increase of the company going online and different users having to use different terminals of the same system and then using you know this tiny bandwidth and the increase of users on the network everything slowed down me at so many troubles with notifying clients receiving emails using the system ,moving product moving product orders from (Yellow sales to completed or from sales to logistics ,updating in products etc. we had quite a bit of issues and also obviously with the price too to increase our package to higher internet speed it was a bit of it too costly for us at the time so we let you just have to adapt (Company E).

It emerged that there was also a challenge with the bandwidth. Further, “*the increase of users on the network everything slowed down*”, and the companies were not prepared for this. The costs increased as companies tried to adjust.

- **Impact of the challenges experienced with internet connectivity and speed**

Participants were asked about the impact that these challenges had on their business, and their responses are illustrated by the extracts below:

These challenges caused Frustration between suppliers and consumers. Uploading their products on the e-shop was delayed. Updating stock levels were delayed.

Delay in payments received and made as the internet was obviously slow (Company D).

There was “*frustration between suppliers and consumers*”, and this is interpreted as a form of unhealthy relationships. There were also delays in “*payments*”, “*updating stock levels*”, and “*uploading products on the e-shop*”. These delays were a result of the slow internet connectivity, and high traffic. Hence, the delays had adverse effects on the business. A participant from Company F had this to say:

so yeah I am in it doesn't impact on item and online means to be connected to the To the Internet and when you don't have that connection there is possible chances of losing an order, may be a query or an email didn't come through and I noticed at times some emails didn't come through so especially an it was sent but not received on my end because there's a break in connection and then you don't really get that the email that becomes through and that obviously makes it difficult when you communicating with customers or somebody wants to something that was obviously with the customers dealing with customers and then on then on the uploading of products, we have to upload products update pricing update our stock on hand on a daily basis with online because if somebody does the purchase we have to fulfil it and make sure we give them the stock so there's a lot of buffering when uploading products because it takes long because the images are big on our website on my website I use I use always use high resolution pictures so those files are big and to Upload them it takes a long time (Company F).

Here, it emerges that there were problems with internet connectivity. This affected response to emails, and orders were lost. Similarly, uploading products on the e-shop became more of a challenge, and it took time. This also meant business was lost. In a similar vein, a participant from Company C had this to say:

the challenge is forced us in terms of During the pandemic our turnover dropped but with us moving to completely digital and outsourcing our turnover dropped but our profitability went up due to the fact that we didn't need the old way of doing business anymore because ecommerce platforms our clients basically could contact us through Internet the contact us digitally they could WhatsApp us, they could email us so that wasn't huge you chunk off the business with it was human skill that no longer was needed, through ecommerce clients could contact us directly become

we did everything digitally and basically our business now runs on very little human interaction (Company C).

By saying “*turnover dropped*”, the participant is amplifying the impact of the pandemic on the business. The business model had to be migrated to the being “*completely digital*”. Through “*turnover dropped*” profitability increased.

5.10.3.1. Objective 5: To evaluate how dynamic capabilities (skills) moderate the relationship between e-commerce resources (internet) and the growth of e-commerce

In this objective the dynamic capabilities are represented by internet skills, and the e-commerce resource is represented by the internet. The researcher asked participants whether they were forced to develop internet skills during the pandemic, and the responses are as illustrated below:

I think the entire world was forced to do that. We as a business that’s in the manufacturing and distribution sector had very less technical, or should I say technology skills. And we definitely needed that to continue operating. Most of us, never used a platform for video meetings in our life and we had to learn how to do those things. It was extremely difficult time for us. Our training budget had to be amended drastically as at least 50 out of our 60 staff had to go on immediate training to with their 9-5 job (Company K).

Participants acknowledged that some of them had no previous encounters with “*a platform for video meetings*”. This means that they had to undergo some sort of training. By saying “*we had to learn how to do those things*”, the participant is drawing attention to different forms of training that were needed. This meant an adjustment to the “*training budget*”.

As I mentioned just now that we were grateful to have hired a skilled workforce eventually (when we realized that the pandemic was far from ending), in order to combat all the digital challenges, we were facing as a business (Company H).

Other participants said they had to hire staff with the necessary skills. By saying “*so I definitely had to up my game*”, the participant from Company B is drawing attention to the importance of acquiring new skills, as this was needed for continued operational activities. For instance, participants had to learn “*how to use zoom*” on different devices. This was something new to most participants and required an investment in time.

Definitely, My main primary income before the pandemic was I'm an interior designer so I fulfil so know how to use an AutoCAD drawing in package and know how to use PowerPoints and those kind of computer packages but I'd never needed to use if you want to call it a bookkeeping package or even excel somebody try to introduce me to use sage which is an accounting package which was disastrous and I just never even attempted to try using it so I did a bit of online googling and self-thought on the excel package just so I could learn how to do spreadsheets of turn over and expenses and those sort of fundamentals that you need for a business, ya so I definitely had to up my game and apart from those computer packages it was just definitely learning how to use zoom and whether it was on my laptop or on my phone just new concepts that I never thought I would have to learn about (Company B).

Participants had to learn new skills such as “*how to use an AutoCAD drawing*”, “*how to use PowerPoints*”. These skills were needed to help the business to remain operational. However, some participants had to self-train through “*a bit of online googling*”.

- **Importance of internet skills for employees**

The participants were asked about how important it was for employees to have e-commerce internet skill in their business during the pandemic. The responses are shown below:

Tremendously important. It was a devastation that we did not know the importance of it before Covid. Covid showed us that we lacked digital skills in every part of our e-commerce business. Our website infrastructure was poor as we didn't even have the capability to enhance this and that's because we didn't know how and where to start. Integrating the payments and deliveries were poorly managed by myself and my team as we didn't have the digital skills to work our way around these new types of issues. So yes, it was very important and wish we had prepared our capabilities sooner. Thankfully my son was helping to put food on the Table as we wouldn't have got through those years financially (Company J).

Participants reported that it was very important. They explained how through Covid they realised that they lacked digital skills in every part of their e-commerce businesses. As one participant noted, “. *yes, it was very important and wish we had prepared our capabilities sooner.*” By saying “*we did not know the importance of it before Covid*”, the participant from Company J was drawing attention to how the internet was often taken for granted

before Covid, and how this perception was forced to change. However, others were caught up with poor “*website infrastructure*”, and this adversely affected their operational activities.

Words cannot describe the importance. Luckily, we picked this up months before the pandemic started and we realized the importance just in the nick of time to plan and prepare all employees and ourselves. Obviously, we didn’t know that Covid was coming but thankfully we did what we did before then, as mentioned earlier that expert stands for Expertise, Quality, Professionalism, Skills, Competence and Trust, and we always striving to make sure that we live by it (Company M).

The participant from Company M reported that it is very important, and they are very lucky that they started it just before Covid because it allowed them to plan and prepare all employees and themselves for it. Though some had started training their staff prior to Covid-19, some of the training was not comprehensive enough. With Covid-19 came the realisation of the importance of IT skills amongst the employees.

I have one lady that's working, and she didn't have a qualification to say of her own but I groomed her and once I showed how to do certain things, she picked it up quite easily and so she didn't really need that like skills set 2 to do the ecommerce part of my business (Company F).

Though some employees received formal training, others received informal training. By saying “*I groomed her and once I showed how to do certain things*”, the participant is referring to the informal IT training. This is interpreted as that training meant to achieve a specific task or training on the job given within the context of achieving a specific practical task. By saying “*she picked it up quite easily*”, the participant is referring to the learning process, and how this was applied for the benefit of accomplishing a specific task. This amplifies the importance of on-the-job training, that is supported by an understanding of daily tasks within the workplace.

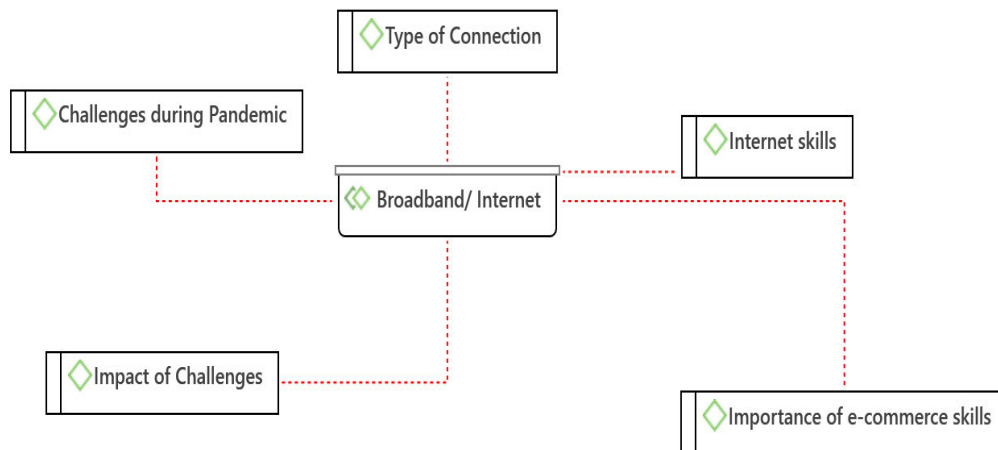


Figure 5.6: Themes that emerged from the usage of broadband and internet skills during the pandemic

Source: Developed from research data

5.10.3.2. Summary of Objective 1 and Objective 5

All the interviewees revealed that they had internet access; however, they identified internet speed and connectivity as major challenges during the pandemic. It was reported that challenges with the internet impacted the business operations and profits. Among the SME owners, there was a clear understanding that most of them lacked the skills and capabilities to be efficient in operating their business solely online. There was the pandemic that most was not prepared for and could not avoid, but the participants reported if they had been geared with the necessary skills that they only adopted after the pandemic, there would have been less impact from the pandemic.

5.10.4. Objective 2: To assess the impact of e-shop features on the growth of e-commerce among SMES during the pandemic

The participants were asked about the changes that they made to their e-shop platform during Covid-19. The word cloud below shows the pattern of text used by the participants. The pattern of text used generated a Token ratio= 0.486, and this means that there was less variability in the text used by the participants. Therefore, the discussion was focused on similar ideas. The text was grouped into sub-themes emerging in relation to e-shops.

- **Changes to the e-shop platform during the Covid-19 pandemic**

Participants were asked to describe the changes they made to their e-shop platform during Covid-19. Below are the results.

so we had to approve in many ways, we have you know much more information available to our customers because now there was no person to person contact we could not do road shows we could not do ad campaigns in person you know we could not do marketing campaign so all of this had to be done through the platform And you know we obviously had to up this level of our pants so I will web developers had to involved you know our ecommerce guys are to get involved with now when the customer clicked a particular equipment he should be able to get all the information available for the equipment through our platform (Company A).

The participant from Company A reported that they had to improve in many ways as they could not do advertisement campaigns in person, road shows or even person-to-person contact. So, they had to get web developers so that their system would become more convenient for their customers. This is interpreted as outsourcing of a service because they did not have the necessary skills within their staff complement. The business model had to be transformed so that customers could “*get all the information*” relating to the equipment through the e-shop.

Actually, we could not as there was not availability of software engineers during the pandemic, some interfacing like payment portals etc. had to be manually checked (Company I).

The participant from Company I said they were affected by the pandemic as software engineers were not available during the lockdown. As a result, they could not make any changes and some systems had to be manually checked.

We had to boost our online presence. We had to provide more accurate, easy to understand, information on our website with regards to product information, payments and delivery. The design of our website had to be re-created into good colour combinations and pictures. Had to re-position and restructure certain pages to provide easy navigation through the website. Had to make sure the website loaded quickly to reduce consumer frustration (Company D).

The participant from Company D had to re-create their website into a good combination. Pictures had to be added for their customers. This is interpreted as visual effects appealing to the customers. They also reported that there was a lot of re-positioning and restructuring done to provide easy navigation through the website for the customers. This was in trying to make sure they do not lose their clients because of the pandemic.

5.10.4.1. *Objective 5: To evaluate how dynamic capabilities (digital marketing strategies) moderate the relationship between the e-commerce resources (e-shop features) and the growth of e-commerce*

In this objective the dynamic capabilities are represented by digital marketing strategies and the e-commerce resource is represented by the e-shop features.

The participants were also asked to describe the digital marketing strategies they used to support their e-shop through the Covid-19 pandemic. Below are the results.

yes we used to be we still used Facebook Instagram as main driver's whole for marketing and Instagram was the one that worked the most and till today we still use a lot of Instagram and Google Ads and that sort of things we again use Google advertisements will be creative on how we advertise because not having the income that we normally have or that revenue we generate we had Make sure we don't overspend on marketing and end up in a situation where we actually losing money versus making money (Company F).

The participant from Company F noted how they used Facebook and Instagram for marketing. For them, Instagram was the one that worked the most and they paired it with Google Ads. In all of this they reported how they had to make sure they did not overspend on marketing, “...and end up in a situation where we actually losing money versus making money.” This denotes that if not monitored, marketing can take a lot of money as there are many ways to do so.

As far as getting our footprint out there through digital company- a big organization called excellent group which is based in Australia, they basically helped us to be the 1st search if you're looking for steel if you're looking forward for automotive we also use our B status as one of the 1st non-white players In the industry to be digitally set up for the full our type of business and this is helped our business tremendously we no longer need to personally go in visiting clients we contact the client directly follow them all our links and what we can do and how we do it and that is basically what works for the business (Company C).

The participant from Company C reported that they sought help from a digital company called excellent group which is based in Australia. This company helped them to basically be the first option when one searches for steel which helped their business largely. This is because most of the business is now done more conveniently online.

The only thing I came to know during the pandemic about digital marketing was Facebook. My son helped advertise the products and website on Facebook (Company J).

It can be noted that the respondent from Company J did not have much knowledge of the digital world as they got help from the participant's son who introduced them to Facebook. It helped them to advertise their website and products.

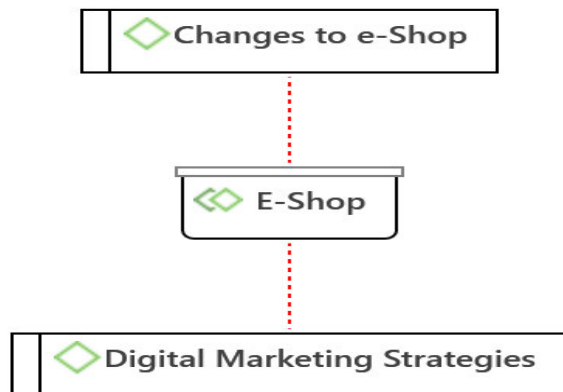


Figure 5.7: Themes that emerged from the usage of e-shop features and digital marketing strategies during the pandemic

Source: Developed from research data

5.10.4.2. Summary of Objective 2 and Objective 5

The e-shop features or website infrastructure were still at infancy stages. Most of them reported minimal changes within a limited budget. Digital marketing was also done on free platforms. The SMEs that used digital marketing strategies efficiently and paid digital marketing, reported that when the pandemic hit, they “*hit the ground running*”.

5.10.5. Objective 3: To evaluate the impact of digital payments on the growth of e-commerce among SMEs during the pandemic

A token ratio was 0.426, meaning that there was less variability in the choice of words used. Hence, there was shared understanding across the participants on the issues that were being discussed. Figure 5.8 illustrates how the text was grouped after being contextualised. Arising out of the discussions with the participants are sub-themes such as protection, payment options, challenges with payments and cybercrime and reducing cybercrimes.

- **Payment options available for customers**

Table 5.27 below presents the results recorded when the participants were asked about the payment options that were available for customers. From Table 5.27 it can be noted that most of the companies used PayPal, Ozow, Snapcan, Payfast, credit cards and PayFlex. This shows that there is more than one way for the customers to pay which is very convenient for them. However, there was also a tendency to use multiple payment methods. This is attributed to different customer preferences, and trust issues with online banking. Therefore, a mix of payment methods was necessary to help meet the diverse needs of the customers.

Table 5.27: Payment options used by participants

Company Retail sector	Payment options
A Manufacturing and distribution (hybrid)	This was PayFlex ... Internet banking be it through PayPal be it through credit card payments online everything in order for us to have this because not everyone has credit card not everyone has access to Internet banking so we have to make sure that we can cover everyone on every platform
B Distribution (hybrid)	... buy an EFT banking
C Manufacturing and distribution (hybrid)	digital payments it's true and also, they PayFlex ... all our clients do direct EFT straight to us ...
D Retail cleaning supplies (hybrid)	PayPal, internet banking
E Retail electrical supplies (hybrid)	we had PayPal as well as the hosted payment gateway so Payfast in the in the beginning. There was a third option which obviously most users wouldn't go for where we put our banking details then you make an eft but that obviously opened us up to security issues.
F Retail (online store only)	Payfast is the only one we use on our website,... we're thinking of a PayFlex now but at the time it was Payfast and when there was time we would send driver's out with deliveries we would send the card machine so customers could swipe when they receive their goods.
G Retail PPE and office supplies (hybrid)	Credit card Efts
H Retail consumer electronics (hybrid)	Credit card, pay pal, pay flex, pay gate, Snapscan, PayU, Payfast
I Retail metal products (hybrid)	Payfast, Ozow, SnapScan, Mobicred, PayFlex.

Company Retail sector	Payment options
J Retail battery supply (online)	Payfast and EFTs
K Retail steel products (hybrid)	Internet banking EFT
L Retail online store Circuit city	PayPal, internet banking, PayFlex,
M Retail online store expert	We have a lot in place, to name a few a is credit card, EFT, and Payfast,

Source: Developed from research data

- **Challenges with payments**

Participants were then asked if they experienced any challenges with their digital payment system during the pandemic. In this vein, a participant from Company H had this to say:

Like mentioned earlier, that we did have challenges with delay in payments due to the quality of internet and skills to have advanced knowledge of these things, so we invested in better internet and hiring a more skilled workforce (Company H).

The participant from Company H mentioned challenges of payments being delayed due to the quality of internet. They have however addressed the issue and hired a more skilled taskforce to deal with the challenge. In a similar vein, a participant from Company M stores had this to say:

Yes, due to all the glitching with the internet, it caused the payments to be disrupted which impacted the entire chain. That was the only real issue we had (Company M).

The participants reported the disruption of payments due to problems with the internet. This shows how they suffered the same problem as those from Company H.

Yes, we did. Where do I start. Our digital payment process experienced many challenges. The internet was slow that it caused a delay in payments. Payments made and payments received. So, this automatically delayed the shipment as stock could only go out once payment was received or payment made to our suppliers, same story, stock could only be received to ship out once payment was made and this hassle went on for the entire Covid-19 state of disaster, ha-ha, was a real state of disaster I tell you. Then many of our consumers were used to paying using full

contact payment as many of our distributors were old and didn't know how to pay via electronic banking. Also due to the huge lag in the using these systems. Many consumers also did not receive confirmation of payment and important notifications (Company L).

The participant from Company L had a lot to share about the challenges they faced. There was the issue of the internet being slow which delayed payments. The delay of payments meant the shipments were delayed which caused disorder and disturbance of the processes they are used to. Generally, all the participants were greatly affected by the issues of the internet slowing down which delayed most of the payments. This is interpreted as a need to upgrade the internet infrastructure and increase the bandwidth. By saying “*many of our distributors were old and didn't know how to pay via electronic banking*”, the participant is amplifying the relationship between the use of technology and age. Here, there is an assumption that more elderly distributors find it difficult to engage with technological innovations. This could be attributed to technophobic people, and a resistance to change. Yet, Covid-19 meant that business models had to be transformed to the digital environment.

5.10.5.1. Objective 5: To evaluate how dynamic capabilities (cybercrime management) moderate the relationship between the e-commerce resources (digital payment) and the growth of e-commerce

In this objective the dynamic capabilities are represented by cybercrime management and the e-commerce resource is represented by the digital payments.

- **Experience with cybercrime**

The participants were asked if their business or some of their consumers experienced cybercrime during the pandemic. Presented below are the results.

so during the pandemic the biggest hotspot was cybercrime and this is because everyone turned to the online platform ,when we had every single payment that was available the biggest cybercrime that we saw was in card payments, right, and we saw flashing of cards so the customers were complaining that they were billed twice but it went through our system Once you know transactions coming out in various other countries where they purchase in South Africa and this was all due to cybercrime so it was a huge challenge for us (Company A).

Yes definitely, people pay, get delivery then reverse payments, also fake EFT POPs where a real issue other issues were customer claiming non delivery (Company I).

The participant from Company I reported that people would pay, get their delivery, and then reverse payments. There were also issues of EFT POPs that were fake and customers claiming non-delivery of products. This shows that they experienced a lot of cybercrimes which greatly affected their business.

We are a direct example of cybercrime. what actually happened was our business was what happened looking to purchase a property and our attorneys banking details and emails was hacked and we received the notification to transfer into the attorney's trust accounts the but it was obviously hacked and everything was legit that was it was everything I had come to was on bank confirmation letters everything was digitally changed but when we did the transfer the transfer went into someone else's account it was a million rand. Our sheer luck was it was flagged through abs a's digital cybercrime that the amount is too large and they purposefully, it was a Friday, they purposely held on to the release of the amount till Tuesday morning until they confirmed with us, and when they called us and confirmed that the account doesn't match up to the name they immediately flagged it and they didn't release the money but it was not flagged because if they a didn't proper cybercrime digital space we will that money would have gone into someone else's account and that account would have been cleared out in 24 hours, our business would have lost a million rand (Company C).

The participant from Company C reported an incident where they had almost lost a million rand because of hackers. They were saved by Absa's digital cybercrime, which determined that the amount was too high, and they held on to it. These responses have shown how some of these companies lost or almost lost a lot of money because of cybercriminals. A conclusion drawn from this is that vigilance is essential in the digital world as there is many ways in which one can be cheated of hard-earned money.

- **Actions taken to protect consumer data**

Participants were also asked what their businesses have done to protect consumer data and fraudulent transactions. Below are the results.

Our business did regular backups which included files and data in general. Our business was aware of the data we had and the risk of having it. Our staff were trained to recognize suspicious notifications (Company D).

The participant from Company D reported the use of backups of files and data. They also trained their staff to recognise suspicious notifications to protect the data. This shows the steps that were taken by the business.

I limited the access of the credit card to no one beside myself. Unfortunately, only when we get burnt do we realise our mistakes and try to solve them (Company G).

Another participant reported that they limited their credit card access to no one else but themselves. The participant also made a comment on how they made the change after they had been affected.

We were quick to act on this as we could not afford to have any losses, and we then limited the number of people that accessed the code/password to zoom meetings that entailed important financial information. We handpicked the staff that was invited to the meetings-it was scary because everyone was desperate and doing crazy stuff, and no one could be trusted (Company K).

The participant from Company K limited the number of people that accessed the code/password to zoom meetings that entailed important information. This came after they had noticed that no one could be trusted, and they had to be vigilant with everyone. They acted upon the idea that you cannot trust anyone as they can be desperate and do anything.

- **Effectiveness in reducing cybercrime**

The participants were asked if their organisation and approaches taken had been effective in reducing cybercrime. Below are the findings.

It did but it didn't actually do the extent that we thought because you know you only as strong as your weakest link, with cyber security so we had to obviously trained staff internally then we had a rare case waited instead of the hacker trying to come through all company that actually try to go through all supplies and request the company information from one of our suppliers from a Gmail email address so they that obviously flagged and asked us in this person is a requesting very profit sensitive information about the company we didn't know we'd never seen that emails from a Gmail account if you know in terms of business so it was definitely

a red flag so they came up with very creative ways to try and hack us (Company E).

The participant from Company E reported that it did not help as they had hoped because the cybercriminals still came up with more creative ways to hack them. This shows how they were still affected by cybercrime even after they had tried to be more careful and changed their systems.

absolutely we no longer we know especially the banks because of cybercrime has got a new platform on all the banking systems but if you want to confirm that this is the clients account the bank may take a few hours extra before the release of funds is sent through, they will confirm to you digitally and through email that this is the correct banking system, if you don't use that confirmation, you run the risk of cybercrime (Company C).

The participant from Company C, however, reported that it absolutely helped. This is because the banks have a new system where a few steps are taken, including taking a few hours to release the money, to make sure that it is not a cybercrime and there is no mistake. This indicates the efficiency of the change.

Yes, it has helped, even though they keep trying, they keep getting blocked off (Company M).

Other participants reported that it helped but the criminals just kept on trying.

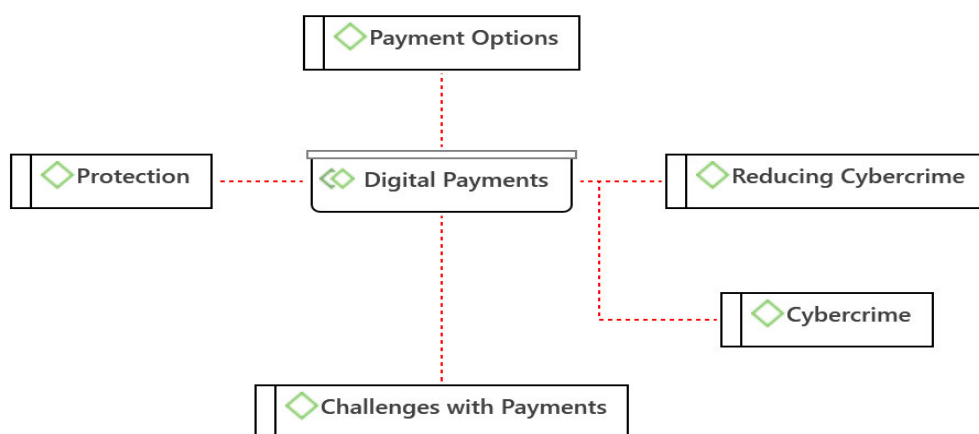


Figure 5.8: Themes that emerged from the usage of digital payments and cybercrime during the pandemic

Source: Developed from research data

5.10.5.2. Summary of Objective 3 and Objective 5

All the interviewees stated that they had used a type of digital payment during the pandemic, most were very diverse in using payment methods. However, many reported that they were victims of cybercrime, and it created fear. Only when this was managed, did they feel comfortable to open up even more to using digital payments.

5.10.6. Objective 4: To critically review the impact of efficient logistics on the growth of e-commerce among SMEs during the pandemic

The token ratio was 0.426, and this indicated that there was high similarity in the pattern of text used. This means that the participants shared similar views.

There was the mention of deliveries, managing logistics and logistics problems regarding the issue of logistics services, as shown in Figure 5.9 further down.

- **Deliveries**

Participants were asked if they outsourced their deliveries or if it had been done by their own company during Covid-19 pandemic.

We used our own company transport to deliver all our products (Company J).

so, but we actually do a little bit of both with local deliveries here in Gauteng, we do have our internal vehicles that we use our driver's, but then for nationwide we do use companies (Company E).

The participant from Company E reported that they do both. They use their internal vehicles and drivers and for nationwide deliveries they use companies.

We outsource the deliveries. My suppliers had their vehicles and we used Courier guy as our main distributor of goods (Company F).

The participant from Company F reported that they do outsource the deliveries. They “*used courier guy*” as their main distributor of goods. This shows that most of the companies do both. This is interpreted as outsourcing of the deliveries service whilst the company focuses on retaining their core business.

- **Problems with logistics during Covid-19**

The next questions to the participants were to find out if their business had experienced any problems with logistics services or order fulfilment during the pandemic.

Yes, my most common and biggest issue during Covid-19 was that I could never deliver on time. Unfortunately, it was out of my control because even though I had my “dompass” to move around, the extra time it took to make sure the safety precautions were followed was very time consuming, from sanitizing to safe distancing, to isolating 24 hours the products/boxes before deliveries. The police everywhere stopping to make sure you have the correct documents and permits to be travelling around. Sometimes the driver would forget the permit at the office and had to drive back to get it- that also contributed, and it delayed my orders from being delivered completely. Also considering the other small interruptions, like the fuel price fluctuations, every time the fuel price went up, I had to increase the cost of an item, which caused frustrated consumers as we all were battling during the pandemic. I knew of the automated tracking system for deliveries but did not know where to get it from and how to go about doing it, unfortunately, I couldn't invest in that and wish we had the skills to implement these things without costing us a fortune, which I am sure it is (Company G).

The participant from Company G reported that they could never deliver on time. This was largely because of the delays caused by the Covid-19 precautions including social distancing, sanitising and 24-hour isolation before deliveries. There were also instances where they would be stopped by the police for permits and the like. Generally, the Covid precautions slowed down their delivery process.

Plenty of problems. I think the biggest thing for us was the travel restrictions, trying to manipulate whatever/whoever we could to get our delivery to the consumer. Many people needed a permit and also many people had fake ones, so the police stopped everyone- which caused delays in deliveries, leave alone the massive number of deliveries the drivers and team had to do. None of our deliveries were done within the 7 days stipulated. Due to the rush, sometimes wrong products were delivered to wrong companies and we had to go back pick up return and a round and round game, not only wasting time, but also wasting fuel and increasing consumer frustration (Company K).

The participant from Company K also reported challenges with the travel restrictions. The police were extra careful because people would use fake permits, so they had to stop everyone. This caused delays for their deliveries. Also, there was a mix up of products in

which case they would be delivered to wrong addresses. This indicates that these SMEs suffered in many areas.

for sure because now during the pandemic everyone was following the same method which means that all these courier companies, they were not geared up with the influx of business that they were going to get which means that they could not give the attention to each individual business the way they could have before the pandemic (Company A)

It emerges that the “*courier companies*” were unprepared for increased business as illustrated by that the statement “*they were not geared up with the influx of business*”. This is interpreted as being reactive rather than proactive. Ultimately, not enough attention was accorded “*to each individual business the way they could have before the pandemic*”. This means that there were changes that disrupted their normal operational activities, and possibly impacted on customer care.

5.10.6.1. Objective 5: To evaluate how dynamic capabilities (logistics management) moderate the relationship between the e-commerce resources (Logistics services) and the growth of e-commerce

In this objective the dynamic capabilities are represented by logistics management and the e-commerce resource is represented by the logistics services.

- **Management and integration of logistics**

The participants were asked if they had encountered any problems with managing logistics the process during the pandemic.

Lockdown and Covid cases amongst drivers were huge impacts for me, we had late deliveries, vehicle shortages and real-time data tracking was hard. The internet speeds could not give us drivers logs and we relied on afternoon invoices to recon (Company I).

The participant from Company I reported how the lockdown and Covid cases affected them. They had late deliveries, vehicle shortages, and real-time data tracking was hard for them.

we did indeed, it was it was it was it was quite a quiet because you know you you'd have someone who was doing something a certain way for such a long period of time and they were good at what they did within that process them but coming with

the pandemic you know these strategies in these processes had to change so under this enormous pressure that that we were facing we had to learn and adapt so we did manage to get past it and we had to Get new knowledge and get new ways to go about solving these new problems that we were facing (Company E).

The participant from Company E was affected by how processes had to change under the pressure of the pandemic. They had to learn and adapt and find ways to solve the problems that they were facing. This shows how the companies had to quickly adapt and change their systems so that they would not lose business.

Managing the logistics also came with maintenance of the vehicles which was horrendous as guys or companies that serviced trucks were at home or sick or died for that matter. The skilled drivers were difficult to find, and they were sick. Also, our suppliers had endless issues with deliveries as well and the entire process just wasn't streamlined at all (Company J).

The participant from Company J reported that another challenge was that drivers were hard to find, and some would get sick or have problems with their vehicles. Overall, the participants were affected by the changes that were needed to be able to work during the pandemic and they had to adapt quickly.

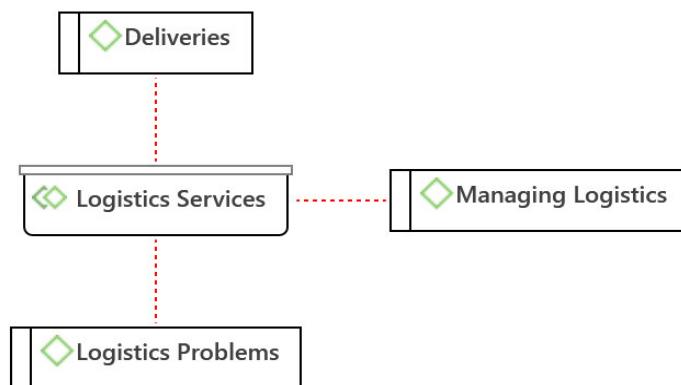


Figure 5.9: Themes that emerged from the usage of logistics during the pandemic

Source: Developed from research data

5.10.6.2. Summary Objective 4 and Objective 5

Logistics was one of the most pressurised departments all over the world. As participants reported that Covid-19 regulations delayed shipments, created stress and anxiety, and led to wrong deliveries being made to consumers. Also, when drivers were sick with Covid-19, the business was short of staff. Some participants also complained of the fluctuating fuel prices.

The integration and management of the logistics was of utmost importance, and even though there were Covid-19 regulations, some companies obtained effective and efficient deliveries and fulfilment due to excellent skilled management of the process especially during a pandemic.

5.10.7. E-commerce growth

There was less variability in the pattern of text (token ration =0.461), and this meant that similar ideas were shared by participants. Figure 5.10 further down shows the issues discussed, which are external and internal factors, performance, reflections, and performance.

- **Performance/growth during Covid-19**

Participants were asked if the performance/growth of their online business (profit, sales, market share etc.) had improved or declined during Covid-19. Below are the findings.

Sales grew, profits were lower, and share was based on price and adverts (Company I).

The participant from Company I reported that their sales grew but their profits were lower. This shows the effect of the pandemic on their business.

Specifically in the 1st 12 months of the pandemic our sales dropped ,our market share dropped, there was not a lot of Work in the industry, that also was not a lot of positiveness in in the economy, we were also hampered primarily because we didn't understand the working of digital platform, our clients also have to get used to us working digitally because most people were no longer at offices they were at home so there was lots of challenges, most people were not used to that, most people worked with loading of trucks, things were all done manually, instructions were all calculated manually, so the 1st year our business we dropped, our 1st year of our business during the pandemic we were fortunate, we broke just even, we worked we didn't run a loss but we made no money, and second year of the pandemic, with our staff being used to it, our clientele being used to it, we also understood shipping line, we understood timelines, we understood the infrastructure, our business in our second year grew by 583% (Company C).

The participant from Company C reported that initially, in the first year of the pandemic, their sales and market share dropped. This was mainly due to the pressure and changes that

the pandemic enforced for their business to keep running. They did not make any money but they did they lose any either. For the second year, after they had become used to the situation, their business grew by a resounding 583%.

Look in the beginning was very stagnated but very stagnated at but it an eventually did pick up and then we basically experienced quantitatively growth from there (Company E).

The participant from Company E reported that things were not going anywhere at first but eventually picked up and they experienced growth from then on. This shows how there was need for the businesses to get used to and adjust for them to stay afloat and not experience losses.

- **External factors impacting growth during the Covid-19 pandemic**

Participants were asked what external factors they think contributed to the improvement or decline they experienced. Below are the findings.

Covid-19 contributed and the travel restrictions that came with it (Company D).

The participant from Company D reported that it was Covid-19 and the restrictions it brought about.

Travel restrictions assisted because people were not able to travel you are not able to do sales you know face-to-face you know logistics during the pandemic increased because now you had so many new logistical companies coming on board you know now you've got people even getting their groceries delivered to home it just shows you that you know logistics increase so all of this was the factors that helped us to get our product to our customer much faster and hassle free and in turn allowed more sales to go through our platform (Company A).

The participant from Company A reported that it was the travel restrictions and the pressure that came with it. There was a lot of competition as others were quickly changing so they also needed to change logistically.

Covid disrupted every part of our business but also made us realise how unskilled we were digitally. So, it was definitely the pandemic and all the ripple effects that came with it that impacted our e-commerce website and beyond (Company J).

The participant from Company J reported that Covid had disturbed them but also showed them how they needed to change digitally.

- **Internal factors**

Participants were also asked if there were any internal factors that contributed. Below are the findings.

My employees and I certainly lacked fundamental digital skills that was needed to run a successful e-commerce business. We could have invested had a better website infrastructure before the pandemic. We had the website and used our platform for sales but to a minor extent. We never expected the pandemic to last that long and never thought that the food on our table will be dependent on our digital skills (Company G).

The participant from Company G reported that the fact that he and his employees lacked important digital skills affected their business. They undermined the severity of the pandemic and how long it would last, and it would have been better if they had invested in a better website structure before the pandemic.

If we did not have the resources and skills to prepare, adjust and set ourselves up, we would have not made it through this (Company H).

The participant from Company H did not have the resources and skills to prepare and adjust to the pandemic in time.

Yes, we hit the ground running when we were given the chance because of our excellent skilled team, together with great capabilities, infrastructure and business resources (Company M).

The participant from Company M reported that they had an “*excellent skilled team, together with great capabilities, infrastructure and business resources.*” This helped them through the pandemic.

Skills, website infrastructure, Digital marketing strategies, cybersecurity, management of logistics, investments...I think if we were more digitally prepared and built a better e-commerce infrastructure, we would have not had the decline but we didn't have the capabilities and that led to our decline (Company L).

The participant from Company L reported that the internal factors that affected them included skills, website infrastructure, digital marketing, and the like. If they had been more digitally prepared, their business would not have declined due to the pandemic. This shows that most of the companies were not digitally prepared for the pandemic. Most of them were greatly affected but those that were prepared did well.

- **Reflections on the Covid-19**

Participants were encouraged to share some reflections, and the findings are as illustrated by the extracts below.

Well, no one ever predicted this, and coming from a manufacturing and distributing point of view, online operations is far from what we focus on. Our online presence was there, but doing all our business digitally, hit us like a tornado. We would make sure our business was equipped digitally to handle day to day operations and communication, and most importantly, we would make sure our staff was skilled to transition into that (Company K).

The participant from Company K reported how they were caught by surprise as no one had predicted the pandemic. As they are a manufacturing and distributing company, having to do business digitally affected them as they were not prepared.

I don't think we would have relied so much on spending a lot of time driving around finding new business. we would have relied on the online portals that are available and realized that it's the way of the future, that people don't mind doing the online shopping and it's moving forward we realize it's steel) actually been a good thing for us to open our eyes up to sort of this is the way people actually like to and consumers not to operate from the safety of their houses and it's all based on trust where the consumer trusts us that we're going to provide a good product and due to Technology you just make it happen yeah (Company B).

The participant from Company B noted how they realised how easy and convenient working digitally was. They were able to open their eyes and accept that it is the way of the future. As they noted, “...*due to technology you just make it happen, yeah.*” This shows how if done well, digital working would be convenient for the business and the consumers as well.

Definitely focus on scalability so just having your website be ready to take on multitude of users and I'm using a multitude of all the different processes within the

online store so you're not internally as well as externally just to have that scalability available. If these resources needed to be used but wasn't used, they would still we would still have to access because if to get up influx users your site could literally stop working. then I will also place a focus on usability you know in the beginning the site wasn't doing too well I know you'd have to click I mean 7 or 8 to actually get to the to the final purchase of our product in the beginning we're in which try to reduce that to 2 to 3 or 4 clicks you know so I'd definitely focus on scalability and user interface or user experience (Company E).

The participant from Company E reported that they focus on scalability which ensures that their website is ready to take on a multitude of users. They focused their attention on making sure that their website would be easy to access and use.

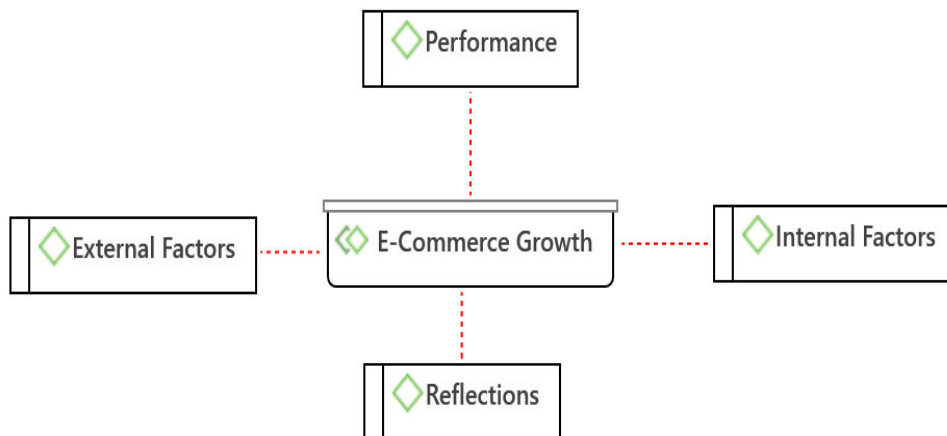


Figure 5.10: Themes that emerged on the impact of e-commerce growth during the pandemic
 Source: Developed from research data

5.11. Summary

Throughout the interviews it became evident that the SMEs had actively engaged with e-commerce activities during the Covid-19 pandemic. The participating SMEs also revealed that even though they were heavily involved in these online activities, this had happened because they were forced to do so, and had experienced many challenges with it. Skills were certainly needed to deal with the daily operations, which were not necessarily academic skills but digital skills.

However, they raised concern about trust of online business activity, which is attributed to cybercrime. The SMEs also had different experiences of logistics services, digital payments, and digital marketing activities. Some of them were challenged by power outages and poor

internet connectivity, whilst others were challenged by a lack of preparedness and limited skills within their workforce. Regardless, the Covid-19 pandemic presented an opportunity for the SMEs to transform their business models.

As the research methodology encompassed a mixed methods approach, the following section links the literature review with the findings from the questionnaires and the interviews and presents the commonalities and differences disclosed by the findings.

This chapter consisted of two sections. The first section was the quantitative findings and analysis, and the second section was the qualitative findings and analysis. From the results achieved, the next chapter provides the discussions based on the findings.

CHAPTER 6:

DISCUSSION OF RESEARCH FINDINGS

6.1. Introduction

Despite the fact that there is a plethora of research on e-commerce, the complexities examined during the Covid-19 pandemic were different, and this was supported by the RBT and dynamic capabilities literature which revealed that there was limited empirical study in the e-commerce retail industry, especially during a national state of disaster such as the Covid-19 pandemic.

In the previous chapter, the research findings were reported and analysed using both quantitative and qualitative techniques. In this chapter, the findings are discussed by referring to previous findings, the research objectives and the hypotheses postulated. The findings from both research methods are then triangulated and discussed since the methods complemented each other.

6.2. Review of the rationale of the study and hypotheses

The inveterate fatal novel coronavirus compelled consumers to make purchases online, due to the lockdown regulations, and more specifically, the need to have less contact with people and be less exposed to areas where there is high foot traffic, such as malls and supermarkets (Sheffi, 2020). In order to cater for the sudden surge in the need for online shopping, businesses had to adapt their operations, business models, product range, etc. and also invest in either creating or improving their online presence to remain in business (Nayal et al., 2022). Although e-commerce platforms are continuously evolving, fuelled by the current pandemic which South Africa faced, e-commerce is far from being exhausted as a research topic. This need began to accelerate rapidly when businesses and consumers shifted to online platforms and South African SMEs were not fully ready to meet the fast-tracked requirement for digitisation. The increased consumer demand has also placed overwhelming pressure on businesses to deal with the associated challenges (Verma & Gustafsson, 2020). The practical implication of this research relates to ascertaining how to assist SMEs to smartly digitise their business model and utilise e-commerce more effectively and efficiently in their operations. An in-depth investigation into, and understanding of the challenges experienced with the adoption of e-commerce by SMEs is necessary, so as to develop strategies to better manage them since they (SMEs) are the bedrock of a country's economy (Abdelrhim &

Elsayed, 2020; Andriani et al., 2020). This study may also assist SMEs to make more informed decisions when using e-commerce platforms, thus contributing to improving the effectiveness of the new way of trading. The findings may also contribute to preparing South African SMEs to adapt more easily, should a similar disruption occur in the future.

6.2.1. Research hypotheses

Table 6.1 summarises the key findings with respect to the hypotheses.

Table 6.1: Summary of the key findings

Hypothesis	Result
H1: Broadband usage positively influenced the growth of e-commerce among SMEs during the Covid-19 pandemic.	Rejected
H2: Skills set moderated the relationship between broadband and the growth of e-commerce during the Covid-19 pandemic.	Rejected
H3: Features of the e-shop platform positively impacted the growth of e-commerce among SMEs during the Covid-19 pandemic.	Rejected
H4: Skills moderated the relationship between the e-shop platform and the growth of e-commerce among SMEs during the Covid-19 pandemic.	Rejected
H5: Digital payment systems influenced the growth of e-commerce among SMEs during the Covid-19 pandemic.	Accepted
H6: Skills moderated the relationship between digital payments and the growth of e-commerce among SMEs during the pandemic.	Accepted
H7: Efficient logistics positively impacted the growth of e-commerce among SMEs during the pandemic.	Accepted
H8: Skills moderated the relationship between logistics services and the growth of e-commerce among SMEs during the pandemic.	Rejected

Source: Developed from research data

6.3. Discussions of the key quantitative findings

6.3.1. The impact of broadband usage on the growth of e-commerce

According to research (Mvambo, 2021), the first step to e-commerce usage is having access and using the internet, which is considered as the first e-commerce resource. H1 was postulated to reflect the existence of a significant relationship between the usage of broadband and e-commerce growth among SMEs during the Covid-19 pandemic. The results revealed that broadband usage does not significantly influence the e-commerce growth and the finding is contrary to that reported by several researchers, inter alia, Gerli et al. (2020) and Zimuto (2018). According to the characteristics of a valuable resource in the RBT theory, the internet is certainly a representative of a valuable resource in achieving growth

of a business digitally during the Covid-19 pandemic, as there was no other way to communicate and do business, other than using the internet (Zhou et al., 2022). Additionally, the Covid-19 pandemic shocked the entire world into dependence on digital communications, business operations, marketing and even partial digital logistics (Majid Gilani & Faccia, 2021). Therefore, a plausible explanation for the unexpected result obtained through regression analysis could be attributed to the fact that all businesses that participated in the survey were using the internet and had some sort of internet connection before, irrespective of whether it was efficient or not. The RBT theory and other empirical evidence (Abbas et al., 2019) have verified the effect of a valuable resource, such as the internet, to positively impact the growth or performance of the business; however, it was proven that during a pandemic, the inefficiency of the internet invariably affected the relationship between broadband usage and e-commerce growth. Resonating further, the somewhat different findings in this study were embedded in the Covid-19 pandemic and the complexities that accompanied it. Due to a resurgence of e-commerce during the pandemic, businesses were forced to use the internet and many SMEs were not knowledgeable on operating and communicating digitally, and had to learn and adapt as their daily bread depended on it (Saba et al., 2021). The survey revealed that the internet was used for various activities during the pandemic; however, due to the questionnaire being closed-ended, it did not provide an opportunity to explain the challenges and intricacies experienced when using digital platforms.

Hence, in concurrence with Denga (2023), for a business's e-commerce efforts to be successful, it must make the most of its financial resources by investing in the development of distinctive internet-enabled capabilities. Additionally, Denga et al. (2022) claimed that businesses are distinct in terms of the resources at their disposal, so the extent to which the costly-to-copy characteristics of e-commerce internet capabilities are embedded in the business process of individual firm varies.

6.3.2. The impact of e-shop features on the growth of e-commerce

H3 stated that the features of the e-shop platform positively impacted the growth of e-commerce among SMEs during a Covid-19 pandemic. The findings from this study confirmed that the e-shop features (website infrastructure) did not significantly impact the e-commerce growth during the pandemic. These findings are contrary to the research reported by Shahzad et al. (2020), who reported a positive relationship between website infrastructure and performance. The e-shop platform is a basic infrastructure of an online

business and features of the e-shop generally attract consumers to purchase (Abraham et al., 2021). This construct is regarded as the front-end functionality of the e-commerce business and represents the valuable and rare resources according to each business separately (Shahzad et al., 2020). This is theoretically explained by the RBT theory and was empirically proven in previous studies to influence the growth of e-commerce or business performance (Nuseir & Aljumah, 2020; Shahzad et al., 2020). Ghandour et al. (2011), who investigated the performance of e-commerce websites from an owner's perspective, concluded that website usage and features positively impacted the website performance.

However, the results in this study build on existing evidence (Mohamed et al., 2008). The aforementioned researchers argued that an e-shop platform and its features (website infrastructure) were not significantly supported to impact the business performance through e-commerce usage. Their investigation concluded that the back-end integration, which was the logistics and inventory management, mediated the relationship between the front-end functionalities and e-commerce performance, and e-shop features on their own were tested, and it was concluded they not have a significant impact on performance. It can be assumed that during the Covid-19 pandemic, SMEs tried to save costs due to uncertain times and therefore only used the rudimentary features of an e-shop and consumers were not impressed and therefore did not purchase items from those websites. Conversely, Dinesh and MuniRaju (2021) argued that during a pandemic, when consumers had the need for the real feel and touch of a product, together with ease of use and streamlined platform, a website that contained appealing features would indicate a positive growth of e-commerce.

The third step of the e-commerce usage was digital payments as businesses had to provide a digital payment portal for consumers to pay for their goods after selecting the items they wanted to purchase.

6.3.3. The impact of a digital payment system on the growth of e-commerce

H5 postulated that digital payment systems influenced the growth of e-commerce among SMEs during the Covid-19 pandemic. The findings in this study supported this postulation, which meant that digital payment systems significantly predicted the growth of e-commerce among SMEs during the Covid-19 pandemic. From an SME perspective, only a small number of businesses master the art of providing safety, security, and a streamlined payment process for users (Sigalov et al., 2021). Digital payment systems undoubtedly represented the valuable and rare resources from the RBT theory. The result obtained in this study is

consistent with what was reported and supported by other empirical studies (Odeh & Yousef, 2021; Sigalov et al., 2021; Chaveesuk et al., 2022).

According to Zimuto (2018), the rarer the resources, like a streamlined, safe and secure digital payment system, the more significant the performance. According to the findings reported in Table 5.6, the participants significantly agreed that their payment systems were easy, and confirmation was sent to the consumer. Consumers were careful with their money, especially during the pandemic, and when a payment system was efficient on an online shopping site, consumers were happy to pursue the sale (Santosa et al., 2021).

The Covid-19 pandemic was considered as a major reason for raising the usage of electronic payment methods and e-commerce (Chaveesuk et al., 2022). The finding in this study was also similar to the view of Odeh and Yousef (2021), who argued that during the Covid-19 pandemic, digital payments had a positive influence on online shopping and e-commerce growth. Therefore, it is sufficient to conclude that digital payments play a significant role in contributing to the growth of e-commerce.

6.3.4. The impact of logistics on the growth of e-commerce

H7 postulated that efficient logistics positively impacted the growth of e-commerce among SMEs during the pandemic. The results of the regression analysis confirmed that logistics significantly predicted the growth of e-commerce during the pandemic. From literature, (Montoya-Torres et al., 2021; Abbas et al., 2019), it became apparent that logistics is represented as a valuable, rare and inimitable resource, where it has been shown that the ability to package specific sets of resources into rare and difficult to replicate capabilities is a key factor in explaining why some businesses have been more successful than others over time. The findings from this study revealed that those SMEs that could not deliver on time and didn't deliver efficient logistics services, achieved a decline in e-commerce growth. This is corroborated by Mohamed et al. (2008), who argued that the back-end functionalities such as logistics services and integration, order fulfilment and inventory management, were tested and supported that they significantly impacted business performance through e-commerce usage. These findings are consistent with (Leung et al., 2020; Kembro et al., 2018), all of whom indicated that logistics had a positive effect on performance, and proved to be significant in this study during a pandemic. Additionally, Hu et al. (2016) concurred that logistics services positively impacted online shoppers' satisfaction level, and therefore increasing e-commerce growth. This finding is also similar to Gu (2022), who emphasised

that front-end functionalities, such as the e-shop platform, need the back-end integration to have a significant impact on business performance. For this reason, Gu (2022) advised that to have significant impact on e-commerce growth, it is important that increased front-end functionalities work in tandem with increased back-end integration. Furthermore, Mohamed et al. (2018) argued that the back-end integration was more crucial to e-commerce than front-end functionality, which was consistent with the resource-based theory. Many studies concluded that back-end integration have a superior involvement to growth, than front-end functionalities, because back-end integration is different for each business and difficult to imitate (Uwizeyemungu et al., 2018; Mohamed et al., 2018). Kembro et al. (2018) also claimed that e-commerce businesses can benefit from back-end integration because it helps them become better able to link dispersed resources together. This, in turn, leads to greater integration and complementary effects among otherwise unrelated systems, which is in turn bolstered by the internet's connectivity and network integration.

The underlying rationale for the impact of logistics on the growth of e-commerce would be that businesses in underdeveloped countries have not been using e-commerce long enough (Kalidas et al., 2020). Thus, front-end functionalities, such as the usage of broadband and website infrastructure, are not common in influencing the growth of e-commerce (Desai, 2019). It is often tailored to a business's strategic context and is woven into the company's operations which are opaque to competitors, back-end integration provides an additional point of differentiation for e-commerce businesses.

6.3.5. Skills

Hypotheses H2, H4, H6 and H8 postulated that skill sets moderated the relationships between e-commerce resources and the e-commerce growth among SMEs during a pandemic. However, only H6 was accepted, and it was concluded that skills significantly moderate the relationship between digital payments and e-commerce growth. Skills were proposed to moderate the relationship between e-commerce resources and e-commerce growth, as the skills required to use the e-commerce resources during the pandemic were represented by all the elements of the dynamic capabilities theory, namely learning, integration and transforming (Karadağ, 2019).

With regard to H2, which postulated that skills moderated the relationship between broadband and the growth of e-commerce during the Covid-19 pandemic, the findings revealed that skills do not moderate the relationship between broadband and e-commerce

growth. These findings are contrary to those reported by some other researchers, (Mota & Cilento, 2020), who linked knowledge and skills to internet use and argued that skills were considered an important capability for internet usage. Similarly, other empirical studies such as that by Van Deursen et al. (2021), who tested skills as a direct predictor and a mediator of business performance, confirmed that skills had a positive impact on performance, suggesting that developing information skills may lead to more effective internet use. However, the finding in this study may be attributed to the fact that during the Covid-19 pandemic, SMEs in the Edenvale area that had an online presence, had the basic internet skills to access the internet to sell online. Although they had the basic skills and used the internet, their e-commerce performance still declined. Therefore, the results obtained in this study revealed that it did not strengthen the relationship between broadband usage and e-commerce growth. A plausible explanation one could conjure is that there were external or internal factors that contributed to this result as it was uncertain and ever-changing times for most businesses.

With regards to H4, which suggested that skills moderated the relationship between the e-shop platform and the growth of e-commerce among SMEs during the Covid-19 pandemic, the findings revealed that skills do not moderate the relationship between e-shop features and e-commerce growth. Mohamed et al. (2018) reported findings similar to the findings of this study and they postulated that an e-shop (website infrastructure) does not influence the business performance. Therefore, it is speculated that because it is a front-end functionality, the e-shop platform was exposed to competitors, meaning their competitors were able to view their website and its features during the pandemic, and they found it easy to replicate the same features, regardless of their skill sets. Therefore, the skill sets of SMEs could not strengthen the relationship between e-shop and e-commerce growth due to it being replicated easily.

H6 was accepted and confirmed. However, although skills proved to be a significant moderator between digital payments and e-commerce growth, this result was rather different than expected. The regression analysis results showed that a low internet skill significantly moderated the relationship between digital payments and e-commerce growth, which meant that a low level of internet skills strengthened the relationship between digital payments and e-commerce growth. This could be attributed to the fact that during the pandemic, when a business owner/manager had the skills and knowledge of all the negative occurrences that could happen when payments are diversified, digital payments breached, and sensitive

information exposed, it made the business owner sceptical about using a diverse range of digital payment platforms. A plausible explanation is that when the Covid-19 pandemic put people into shock and financial desperation, the businesses that had fewer capabilities and skills were more open to diversifying payment systems to gain financial benefits, even if this put them at risk.

H8 postulated that skills moderated the relationship between logistics services and the growth of e-commerce among SMEs during the pandemic. This postulation was not supported and the results are contrary to those reported from other studies, where some researchers asserted that the higher the dynamic skills capabilities, the stronger the relationship between logistics and e-commerce growth (Witkowski et al., 2020; Mohamed et al., 2018; Zimuto, 2018). These results could be linked to the overwhelming pressure from the logistics department/companies to deliver and manage the supply chain efficiently during the pandemic. Additionally, it could be linked to dealing with the complexities of the Covid-19 pandemic, like reverse logistics and less predictable demand since consumers could shop at any time on an e-shop and expected speedy delivery.

6.4. Discussion of key qualitative findings

The discussions of the qualitative interviews are presented according to the research objectives. Findings in line with Objective 5 are discussed with each of the objectives from 1 to 4 according to the interview schedule.

6.4.1. Objective 1: To critically analyse the impact of broadband usage on the growth of e-commerce among SMEs during the Covid-19 pandemic

In the qualitative part of this study, it was reported by all the businesses that were interviewed that SMEs experienced many challenges with the internet during the pandemic, and instead of the internet usage rendering a positive influence in their online business, it had a negative effect on the growth of e-commerce. The internet efficiency and effectiveness, during the pandemic, caused a lot of frustration and a decrease in their profits. The interviewees reported that the internet speed issues and low connectivity impacted their daily business operations tremendously. In concurrence with this reporting, Feldmann et al. (2021) emphasised that the waves of the Covid-19 pandemic and the government regulations that accompanied this impacted the internet traffic and caused low connectivity. The participants from Companies H and Company D reported that during business meetings, the connectivity was very poor due to the number of users on one fibre line and the service providers could

not deal with the pressure and solve the problems timeously. The slow internet speed that was reported by all the participants in this study had severe repercussions on business operations and 80% of the participants reported on delay in payments, shipments and this caused a delay in uploading products and updating stock levels.

6.4.1.1. Objective 5: To evaluate how dynamic capabilities (skills) moderate the relationship between the e-commerce resources (internet) and the growth of e-commerce

It was noted, from the participant in Company M, that they were far different from the rest of the businesses interviewed, as they prided themselves in being unique and different in terms of professionalism, skills and resources, which in turn gave them high profitability during the Covid-19 pandemic. The report from the participant in Company M is consistent with the study that discussed the access to resources and the importance of skills to use the resources (Van Deursen et al., 2021). All the participants that were interviewed accentuated that e-commerce internet skills were of utmost importance during the pandemic and many of them revealed that they had lacked the necessary skills at the start of the pandemic and tried gaining these skills from free online courses, and some participants tried specialised training. Some researchers (Singh Dubey et al., 2022; Mota & Cilento, 2020) were in consensus that there was a soft skills gap amongst SMEs in emerging economies and the participant from Company K reported how difficult it was to train staff during a 9-5 job and still conduct daily work activities. This in-depth analysis showed that Covid-19 made the participants rethink their capabilities and they desired to have had invested in these capabilities sooner.

6.4.2. Objective 2: To assess the impact of e-shop features on the growth of e-commerce among SMEs during the Covid-19 pandemic

A business website is crucial because it demonstrates the business's professionalism and helps customers become familiar with the company (Giantari et al., 2022). The respondents from Company B, F, and J, among others, reported that they used basic e-shop features within a certain budget and did not make considerable changes to their website. However, there were respondents from Company D and M that boosted their online presence by streamlining their website for ease of use and invested in quality pictures and videos to illustrate their business professionalism to increase consumer trust. These respondents revealed that basic e-shop features have a minimal/no impact on the growth of e-commerce;

however, when businesses used the state of art features, a supreme growth was achieved during the Covid-19 pandemic.

6.4.2.1. Objective 5: To evaluate how dynamic capabilities (digital marketing strategies) moderate the relationship between the e-commerce resources (e-shop features) and the growth of e-commerce

During the pandemic, consumers depended and trusted on what was seen online, and the methods of marketing a product (Andiana et al., 2021). Digital marketing is representative of the characteristics found in the dynamic capabilities theory as it is used to sense the need for changing with the environment, together with transforming the e-shop platform. Many researchers, inter alia Singh, Deshmukh et al. (2021), argued that there was a correlation between the severity of the Covid-19 pandemic and the severity of the effects on businesses, including reduced capacity, increased restrictions on serving customers, difficulty sourcing raw materials and falling customer purchasing power, and it was recommended to SMEs to upsurge the use of digital marketing strategies in their website. The qualitative interviews in this study reported that most of the businesses, like the participants Company A, B, F and J, all used free social media marketing tools such as Facebook, Instagram and Twitter, and did not invest in other types of paid marketing such as search engine marketing, and search engine optimisation. The interviewees that used paid digital marketing with their e-shop achieved a rapid growth in online visits and e-commerce, therefore it could be sufficient to assume that digital marketing contributed towards strengthening the relationship between the e-shop features and growth of e-commerce. Kadhim (2021) concurred with this finding, and revealed that digital marketing was a significant moderator between business resources and its performance. Resonating further, Andiana et al. (2021) corresponded with these respondents on the investment in digital marketing strategies strengthening SMEs e-shop platforms during the Covid-19 pandemic, and Effendy et al. (2021) suggested that the implementation of digital marketing strategies would increase website traffic and sales, especially during a pandemic.

The participant from Company C understood the value of digital marketing and complemented the literature available, that revealed during a pandemic, using this tool (digital marketing) was of utmost importance to enhance website quality for consumer purchase and e-commerce growth (Thaha et al., 2021; Matta et al., 2020; Jayadeva, 2022). Through the effective mobilisation of digital capabilities, SMEs are able to not only gain access to market intelligence but also more precisely process data of relevance to their

operations. SMEs can better compete in the online marketplace and tailor their value propositions to customers in a variety of global markets. However, the participant from Company F reflected on the costly attributes that came with investing in digital marketing, and therefore had to rethink the budget of investment, even though the business was aware of the benefits. Wang et al. (2021) stated that there is a clear and substantial correlation between a business's adoption of digital technology, particularly digital marketing, and the business performance. However, research conducted by Din et al. (2022) suggested that digital advertising capabilities have had minimal impact on the effectiveness of e-commerce platforms. Furthermore, Sousa-Zomer et al. (2020) argued that there was no improvement in how well the website correlates with financial results after implementing digital marketing strategies. This is because businesses and consumers saved more money to buy necessities during the Covid-19 pandemic, instead of investing in what was seen as unnecessary.

Overall, it is noted that digital marketing is a capability that differs among businesses and therefore has a different effect on the relationship of the e-shop features and e-commerce growth. The participants in this study concurred with the studies above and concluded that when a business uses digital marketing strategies in an efficient way, it proves to provide positive support towards the e-shop platform and e-commerce growth.

6.4.3. Objective 3: To evaluate the impact of digital payment systems on the growth of e-commerce among SMEs during the pandemic

Covid-19 enforced most people to take the risk of using the electronic payment approach and then decide to trust it or not depending on how cybercrime was managed by the business and banks (Khweiled et al., 2021).

The participants revealed that the internet caused many issues with their digital payments. It was reported that there was a delay in payments made and received, together with delay in deliveries from suppliers and to customers due to delayed payments. Additionally, due to the internet connectivity complications, the participant from Company L also had consumers who he supplied, who were old and did not know how to manoeuvre around the digital payment systems freezing. It could be attributed that, like some of the other participants who reported that they were 'old school', there was a need for digital transformations, skills and knowledge on how to operate these systems. This is in concurrence with Anim-Yeboah et al. (2020), who did a qualitative study with e-commerce platforms among SMEs in Ghana

and reported the importance of capabilities and managing the skills gap to obtain digital transformation.

6.4.3.1. Objective 5: To evaluate how dynamic capabilities (cybercrime management) moderate the relationship between the e-commerce resources (digital payment) and the growth of e-commerce

The participants from Companies A, C, D, G and K were impacted by cybercrime and this impacted their business; however, they took immediate action as they reported risk and fear among them. Cybercrime management represented dynamic capabilities as it conformed to the characteristics of sense, learning, integration and transforming. Firstly, this comprised being able to sense the cyber threats, learning about the security issues, integrating new software, training and programs to prevent this, and transforming the business through cybercrime management. Concurrently, the literature complemented the participants feelings of risk and fear as Khweiled et al. (2021) emphasised that an the Covid-19 lockdown increased the likelihood that cybercriminals would be able to take advantage of the situation because of the increased percentage of the population with access to the internet, as well as the increased feelings of isolation, anxiety and fear that resulted from the situation. Additionally, fear and panic caused by the pandemic were utilised by cybercriminals who used malware like viruses, ransomware, and spyware to attack, steal, or cancel personal data on personal computers. This data was then used for variety of malicious purposes such as accessing bank accounts and blackmailing victims for ransom payments (Ahmad, 2020). The interviewees reported that when cybercrime was managed, they felt safer to trust and use digital payments more diversely in their business. According to Chaveesuk et al. (2022), their research found that 56% of people surveyed had never used an electronic payment system before the start of the pandemic, while 21% had never used an electronic payment system and were therefore unable to trust the use of online payment methods. For example, “Cybersecurity is one of the most complicated factors in electronic payment systems” as stated by one of the marketing experts who participated in the study. The high risk of having their financial information stolen, many businesses and consumers in developing countries reportedly prefer to conduct transactions in person at traditional physical markets rather than online (Khweiled et al., 2021). Similarly, El Khoury et al. (2022) further suggested that cybersecurity strengthened the relationship with performance by boosting profitability of businesses and supporting the influence of technological environment. In consensus with the literature, the participants from Companies C and M reported that when they took action to

protect their business against fraud, and were extra careful about sensitive information being exposed, they used digital payments more openly and invested in security. Some of the respondents reported that they had secured remote access to important business data and provided the right security capabilities. This action assisted the SMEs in a streamlined experience, and that strengthened the use of digital payments for e-commerce.

6.4.4. Objective 4: To critically review the impact of efficient logistics on the growth of e-commerce among SMEs during the Covid-19 pandemic

Joshi and Sharma (2022) suggested that during an extreme uncertainty situation like the Covid-19 pandemic, supply chain and SMEs performance is strengthened by the dynamic capabilities, which are achieved through identification, achievement and transformation.

All the participants in this study reported issues with receiving and delivering goods during the pandemic. There were endless issues and the participants reported the following: travel restrictions caused delay in shipments, fluctuating fuel prices had an impact on pricing of products, delivery was never on time, wrong products delivered, damaged products delivered, frustrated consumers returning goods and extra reverse logistics costs and warehousing, overwhelming pressure and sick drivers, therefore short on staff which impacted deliveries. The qualitative results showed that some participants sensed the need for adaptability and understood that if consumers didn't receive the right goods on time, it would impact the confidence of consumers in their business and impact profitability. The interviewees also revealed that when they could not deliver on time, deliver the right product, deliver in acceptable condition, and could not manage the integration of the logistics from their supplier to consumer, it took a long period to grow their online sales and market share. The participant from Company F reported that when consumers that bought from his e-shop did not receive their goods on time, it impacted the reputation and professionalism of his business, together with his e-commerce growth.

6.4.4.1. Objective 5: To evaluate how dynamic capabilities (logistics management) moderate the relationship between the e-commerce resources (logistics services) and the growth of e-commerce

The participants from Companies C, E and F revealed that when their logistics was well managed, integrated, it supported the transformation of the logistics services and e-commerce growth. The participant from Company E was affected by how processes had to change under the pressure of the pandemic, and they had to learn to adapt and find ways to

solve the problems that they were facing. Therefore, dynamic capabilities, which was the management of the logistics, had to transform to the new uncertain environment. Other researchers (Mathivathanan et al., 2018; Hong et al., 2018) also concurred that dynamic capabilities enhance the relationship of supply chain services and performance.

Overall, the participants in this study were affected by the changes of the lockdown regulations during the pandemic and they had to quickly adapt and transform. As the participants adapted and found their way around managing these issues of logistics integration, it supported the logistics services provided, and reinforced its relationship with the growth of e-commerce.

6.5. Triangulation of data

Integrating of the quantitative and qualitative methods is an essential component of mixed methods research (Turner, 2017). At this stage, the study is synthesised from the mixing of data results and drawing integrated conclusions. This was achieved by an analysis and comparison of the findings from the survey that was administered, the interviews with the respective decision makers and the literature review. The purpose of concurrent triangulation design in this study was to use both qualitative and quantitative data to define relationships more accurately among variables in this research (Dawadi et al., 2021).

6.5.1. Broadband usage and growth of e-commerce during a pandemic

There was a common understanding amongst the quantitative and qualitative respondents that the internet was used during the pandemic for business operations. The findings from the statistical analysis revealed that broadband usage did not significantly influence the e-commerce growth. Congruent to the regression results, the qualitative findings provided insight about the numerous challenges the SMEs experienced with internet. The interviewees revealed that the impact of the internet speed and connectivity issues included delay in payments made and received, delay in updating stock at hand, delay in deliveries, frustrated consumers, buffering of business meetings, and this impacted the profitability of their online businesses. Therefore, based on the quantitative and qualitative analysis, it can be concluded that the internet was used for many business activities during the pandemic; however, there were underlying issues that contributed to an initial decline in performance of their online businesses.

- Broadband usage, skills, and growth of e-commerce during a pandemic

The quantitative results also indicated that skills did not significantly moderate the relationship between broadband and e-commerce growth. However, the interviewees revealed that e-commerce internet skills were of utmost importance to support the business. The majority of the participants from the interviews revealed that when the pandemic started, they didn't have the necessary skills, but as the pandemic continued, the staff was trained with digital skills, which contributed towards a steady growth. For example, the participants from Companies C and E reported that their sales dropped at the start of the pandemic, but their sales grew drastically in the second year.

6.5.2. E-shop features and the growth of e-commerce during a pandemic

The findings from the quantitative questionnaire revealed that the e-shop features (website infrastructure) do not significantly influence the e-commerce growth. However, the qualitative study indicated that most of the business owners did not want to invest in changes to their e-shop, and a few of the participants made minimal budgeted changes. Therefore, although the features of the e-shop platform were used during the pandemic, this was done inefficiently and basically. For example, the participant from Company E reported website scalability issues, which meant that there was a restricted number of users that were allowed on the website at a given point in time, and if that number of users exceeded that threshold, the website would freeze. Therefore, the results from the questionnaire and interviews verified each other by concluding that although the features were used, this did not influence the growth of e-commerce during the pandemic.

- E-shop features, digital marketing strategies and the growth of e-commerce during a pandemic

Additionally, this can be explained by the moderating variable. According to the statistical analysis, skills did not significantly moderate the relationship between the e-shop and e-commerce growth. However, the interviews revealed that they needed the skills for utilising the best digital marketing strategies on their e-shop platform, and that those participants who adopted free digital marketing, achieved a minimal growth compared to those participants who used paid digital marketing and achieved a remarkable growth. Throughout the interviews, the participants mentioned the importance of digital skills and if they had acquired these skills sooner, it would have impacted their online business positively from the start of the pandemic.

6.5.3. Digital payments, cybercrime management and the growth of e-commerce during a pandemic

The findings from the questionnaire indicated that digital payments significantly influenced e-commerce growth during the pandemic. The qualitative findings verified the quantitative findings. The respondents from the interviews revealed that they used diverse payment methods; however, the most common challenge experienced amongst all the participants was the internet connectivity causing a delay in payments made and received.

- Digital payments, cybercrime management and the growth of e-commerce during a pandemic

Additionally, this could be further explained by the moderating variable. The regression analysis revealed that skills was a significant moderator between digital payments and e-commerce growth during the pandemic; however, the lower level of skills initiated a stronger relationship between digital payments and e-commerce growth. A plausible explanation was that unskilled SMEs were more open to diversity in payments and ignorant to the risks of sensitive information being leaked, which resulted in a stronger relationship between digital payments and e-commerce growth. Hence, in coexistence with the quantitative, the participants from Companies I, C, G and K were victims of cybercrime and reported that as a business, their accounts were hacked, fake proof of payments were received for a sale and when purchasing property for business, wrong account details were provided causing funds to reach the wrong account holder, and sensitive information was leaked to the cybercriminals. The interview findings show the need for employees to be trained in recognising suspicious notifications and be involved in appropriate courses to enhance their cybersecurity knowledge. They did however report that they had taken action to protect their business from fraudulent transactions and leakage of sensitive information, and these actions had assisted in reducing cybercrime.

6.5.4. Logistics services, logistics management and the growth of e-commerce during a pandemic

The findings from the two data collection instruments of this study concurred that efficient logistics positively influences the growth of e-commerce. The feedback from the respondents in the interviews revealed endless logistics issues during the Covid-19 pandemic, which negatively impacted their online sales. They also revealed that during the phase of learning to adapt to the sudden shock, there was a decrease in online sales; however,

as the businesses adapted, they achieved a rise in online sales. For example, the participant from Company A reported that the logistics companies were not geared for the influx of business and delay in deliveries which became the norm; however, the participant from Company E reported that during the pandemic, strategies and processes had to change under the enormous pressure they experienced, but their business learnt to adapt and managed to overcome the new challenges brought about by the Covid-19 pandemic. Therefore, the qualitative interviews and quantitative results verified each other, that efficient logistics had a positive influence on the growth of e-commerce during the pandemic.

6.6. Summary

As the research methodology encompassed a mixed methods approach, this chapter presented the discussion of the results from the quantitative analysis and qualitative analysis. The discussion has shown a convergence of the findings in terms of the impact of Covid-19 on e-commerce among SMEs during a pandemic, taking into account the resources and capabilities of the businesses, reported in the literature review, conceptual and theoretical framework chapters, as well as reflecting on the hypotheses tested. Important issues were raised after triangulation of data, and after the discussions it became evident that all four independent variables of the e-commerce process (e-commerce resources) were needed to work in collaboration with each other during a pandemic, effectively and efficiently, in order to achieve growth of e-commerce. It was also found that the e-commerce resources were not used in the way they had been used prior to Covid-19 pandemic, and neither were the required capabilities the same way before the pandemic. The e-commerce resources were used extensively during the pandemic, and the capabilities were needed desperately. SMEs underestimate the power of investing in the efficient e-commerce resources. As noted and complemented by other studies (Penrose, 2019; Pitelis, 2009), e-commerce resources on their own are futile, dynamic capabilities are needed to support the e-commerce resources for optimum growth, and this study proved the same.

In the next chapter, conclusions are drawn, limitations are presented, and suggestions are made for areas of future research.

CHAPTER 7:

CONCLUSIONS AND RECOMMENDATIONS

7.1. Introduction

The study aimed to assess the impact of Covid-19 on e-commerce among SMEs in Gauteng, South Africa. The findings of the study revealed that SMEs experienced many challenges with e-commerce during the pandemic and many of the SMEs did not have the necessary resources and capabilities to continue operating through the pandemic. The study highlighted aspects of the e-commerce resources that impacted the growth of e-commerce and the dynamic capabilities that strengthened the use of e-commerce resources.

In this chapter, a reflective summary of the key findings is presented, followed by recommendations, contributions to the study, limitations, recommendations for future research and conclusions.

7.2. Key findings

The problem statement identified the need for an investigation into the impact of Covid-19 on e-commerce among SMEs during the pandemic. The problem statement provided the basis for the aim and hypotheses of the study.

7.2.1. Reflections on research Objective 1

The first objective was to critically analyse the impact of broadband usage on the growth of e-commerce among SMEs during the Covid-19 pandemic. The literature on the usage of broadband reveals that it positively influences the growth of e-commerce. However, the empirical findings did not support what was found in the literature review. It was very evident through the quantitative and qualitative analysis of the research findings in this study, that all the SMEs used the internet to conduct their daily business operations during the pandemic; however, this did not positively influence the growth of e-commerce. The qualitative data provided reasons to why this relationship was insignificant and it was found that many challenges were faced with the internet speed and connectivity due to everyone using digital platforms to communicate. The internet speed and connectivity challenges impacted businesses in various ways which can be summarised as follows: delays in updating product information, slowness in meetings, delays in receiving orders, delays in communicating, buffering of connectivity during meetings, delays in sending important

emails, delays in payments made and received, delays in deliveries, and delays in updating stock levels.

7.2.2. Reflections on research Objective 2

The second objective of this research was to assess the impact of e-shop features on the growth of e-commerce among SMEs during the Covid-19 pandemic. The literature on the e-shop features and their influence on e-commerce growth was reviewed and prior studies provided evidence that the e-shop features positively influence the growth of e-commerce. However, the empirical findings did not support what was found in the literature review. Through the empirical and qualitative research, it was noted that very basic and inefficient e-shop features were used among SMEs during the pandemic in order to save financially, and the findings demonstrated that the features of the e-shop platform did not significantly influence the growth of e-commerce during the pandemic.

7.2.3. Reflections on research Objective 3

The third objective was to evaluate the impact of digital payment systems on the growth of e-commerce among SMEs during the pandemic. The literature on the digital payments and their influence on e-commerce growth was reviewed and it was concluded that digital payments positively influence the growth of e-commerce. The empirical findings supported what was found in the literature review.

7.2.4. Reflections on research Objective 4

The fourth objective was to critically review the impact of efficient logistics on the growth of e-commerce among SMEs during the Covid-19 pandemic. The literature on the logistics and its influence on e-commerce growth was reviewed and prior studies provided evidence that logistics positively influence the growth of e-commerce. The empirical findings supported what was found in the literature review. It was ascertained that efficient logistics positively influenced e-commerce growth.

7.2.5. Reflections on research Objective 5

The fifth objective was to evaluate how dynamic capabilities moderate the relationship between the e-commerce resources and the growth of e-commerce.

- a. Literature was reviewed and prior studies provided evidence that skills strengthen the usage of e-commerce. However, regression analysis showed that digital skills did not moderate the relationship between broadband usage and e-commerce growth

during the pandemic as there were too many external factors that were a greater contribution. Conversely, the interviews revealed a major importance of e-commerce digital skills, which were notably a desperate need during the pandemic.

- b. Previous literature revealed that digital marketing strategies strengthen the usage of e-commerce. Additionally, the qualitative results revealed that those SMEs who used free social media advertising achieved a minimal growth; however, those SMEs that used paid digital marketing achieved a substantial growth in e-commerce. The qualitative findings emphasised the requirement for skills development and improvement of knowledge among SMEs to capitalise on advanced digital marketing strategies in order to support the relationship between the e-shop platform and e-commerce growth.
- c. Prior studies provided evidence that the management of cybercrime, or cybersecurity, strengthens the usage of e-commerce. The studies also revealed through the regression analysis that a low level of skill moderates the relationship between digital payments and e-commerce growth. Additionally, Covid-19 forced SMEs to adopt diverse digital payment systems, which influenced the growth of e-commerce during the pandemic. However, the interviewees reported that this strategy was only followed when cybercrime was managed. Therefore, the management of cybercrime strengthened the use of digital payment portals and e-commerce growth.
- d. According to the statistical analysis, logistics management does not moderate the relationship between logistics services and e-commerce growth, it directly influences the e-commerce growth.

7.3. Recommendations

It was specifically stated at the outset that this study endeavoured to investigate the impact of Covid-19 on e-commerce among SMEs in Gauteng. Based on the research findings some recommendations are proposed which are intended to contribute to creating an agile, resilient and digitally prepared work environment for SMEs, should a disruption occur, the digital infrastructure and capabilities of the business will not be crippled.

7.3.1. Broadband

Broadband usage did not significantly influence e-commerce growth and a large number of issues surfaced related to the internet, which mainly revolved around the internet speed and

internet connectivity, which hampered their online businesses. The following recommendations were suggested:

- **Need for better internet infrastructure**

Due to Covid restrictions and lockdown regulations in South Africa it was clear that moving business operations completely online was the only way to keep functioning. However, it is more important for SMEs to have consistent and reliable broadband connection to avoid business paralysis. Therefore, the option of having two or more connectivity streams seems to be a sensible strategy to ensure seamless operations, efficiency and exponential business growth.

- **Explore more internet options for large user support**

Since connectivity and speed of the internet impacted every area of the business, it is highly recommended that SMEs gain knowledge of the different options available with regards to service providers for faster and more efficient networks that can handle a large number of users.

- **Invest in better Wi-Fi packages**

The cost saving model versus broadband after service needs to be scrutinised before any solution is considered. It is advisable to upgrade to Wi-Fi routers that can accommodate higher internet speed and better signal.

7.3.2. E-shop features

It became evident that respondents used very basic e-shop features, and this negatively impacted e-commerce growth. In order to increase the growth of e-commerce using the e-shop platform, SMEs are recommended to do the following:

- **Invest in proper e-shop features**

During the Covid-19 pandemic, people all over the world, including business owners, became consumers of online shopping. Therefore, there was an influx of users on the websites and many SMEs did not know how to deal with this at minimal cost. The investment in user interface and scalability should allow streamlining of a purchase, and most importantly scalability will allow many users to browse and shop on the website at the same time.

- **Invest in paid digital marketing to increase website traffic**

Most of the respondents revealed that they used free social media ads and this did not strengthen the relationship between their e-shop and e-commerce. However, the SMEs that did use paid digital marketing saw an increase in website traffic and e-commerce. Therefore, it is recommended that the majority of the SMEs should invest in and budget for paid AdWords and SEO, which will increase the conversion rate on the e-shop.

- **Virtual reality**

Virtual reality is a developing trend, the option of website development into a store type 'touch and feel' concept could convert the consumer into making a purchase. The notion of seeing the product in a familiar environment reduces the purchasing load. Consumers could see their item through a virtual reality interface or hologram. Assembly instructions or even the purchase journey could be incorporated. The digital playground is limitless, and SMEs should also focus on their core competency and be cognitive of development and maintenance costs.

7.3.3. Digital payments

It is evident from the findings that the diversity and safety of payment methods were challenging. However, it was a direct positive predictor of e-commerce growth if strengthened by cybersecurity. The following recommendations are therefore made:

- **Use third-party payment portals**

The access and trust in third-party payment portals must be considered to ensure consumer safety and data management. The cost is higher, but it protects against the leakage of sensitive information. The recent POPI act ensures that business and consumer data are not shared with other parties. The protection of key confidential information is critical to businesses and consumers. SMEs are vulnerable to cyber fraud and the insurance and recovery cost outweigh the sales revenue. It is therefore important to track and create a sustainable partnership with one's banking sector.

- **Real time payments for accountability**

Various payment solutions should be explored, namely contactless card payments (tap on device screen), tap the laptop with your credit card to ensure fast reliable payments, and no credit card details required. Biometric authentication could also reduce cybercrime and improve consumer accountability.

- **Train staff to recognise breaches in security**

Employees and owners should attend appropriate courses to enhance their cybersecurity skills.

- **Create trust**

It is the responsibility of the e-commerce platforms to implement necessary monitoring measures to protect the customers' private information and the integrity of their online transactions. This would increase trust among customers, businesses, and even first-time online shoppers.

7.3.4. Logistics

It emerged that there is a positive relationship between logistics and e-commerce growth; however, the complexities of logistics during the pandemic were endless, and the following recommendations are made:

- **Centralisation of warehouse and distribution**

Invest in centralised warehousing and distribution. Most SMEs did not know when or where their delivery was and relied on final day recons to realise the final sale. The utilisation of this method should save logistics cost and contribute towards growth.

- **Investment in enterprise resource planning**

Digital barcoding, scanner apps and invoicing that are linked to an entry Enterprise Resource Program system could improve efficiencies, together with just-in-time material supply. This could ensure that the SME replenishes faster and troubleshoots on orders not executed. Customer satisfaction levels will increase and efficiency and confidence levels in inventory and new product exploration could be pursued.

- **“Milk run” concept**

Costs derived from logistics are probably the most concerning. The Consumer Protection Act and reverse logistics could reduce the profits of most SMEs, especially during a pandemic. Therefore, a combined effort to create a mobile application for local driver pick up and delivery can yield greater profits. Local deliveries could be also modelled similar to a ‘milk run’ concept within an area so that delivery companies could align to one vehicle per a route with multiple drop offs.

- **Fourth-party logistics**

Extended isle and fourth-party logistics can considerably reduce overhead and inventory costs. Many original equipment manufacturers provide a 'skin' interface to the SME's site. The purchase transaction and delivery are done on behalf of the SME. Product scope and availability could be increased without high capital investments as fourth-party logistics control transportation, warehouses and anything that is moving, by optimising transportation operations, coordinating suppliers, integrating supply chain technologies, synchronising inbound and outbound logistics and managing distribution networks.

- **Local partnerships and co-existence**

The Covid-19 pandemic presents the opportunity for e-commerce businesses to form partnerships with their brick-and-mortar counterparts in the tier-2 cities. Having local and independent shops act as pick-up locations is a great way for online retailers to increase their reach. Furthermore, this helps offline stores attract more customers. It is crucial that brick-and-mortar stores and their online counterparts coexist in the modern era.

7.3.5. Dynamic capabilities (skills)

It was evident through the quantitative part in the findings in this study, that skills strengthen the relationship between digital payments and e-commerce growth. Additionally, the qualitative interviews emphasised the need for and importance of skills to support all four e-commerce resources in this study. SMEs should therefore ensure that they and their staff possess these capabilities, and they should consider the following with regards to sensing new opportunities, learning, integrating and transforming businesses:

- Ensure employees are trained with the right e-commerce jargon, methods and management that will yield growth in any SME. The pandemic has taught businesses that risk management planning is vital and SME owners should consider disaster management resource planning and a development plan for employees. The Covid pandemic has taught businesses that the current environment in South Africa has the capability of manifesting into numerous situations at the same time. SMEs that have employees who are cross functional in the business could create a competitive advantage against other SMEs.
- Covid has thought businesses that SMEs should not be limited to a copy and paste model, entrepreneurs must develop stand-out methods to complement their ecommerce platforms. The future of drone deliveries should be considered. If this

method had been adopted during the pandemic, with government support and proper infrastructure, SMEs would have had less or no issues with logistics. Shared pick-up locations could also be considered, whereby a consortium of SMEs uses a pick-up centre for their products, in different locations.

- SMEs should prioritise their investments in e-commerce talent, managerial skills, and improving staff e-commerce technology training. The owner-managers of SMEs should also build their capacity for managing e-commerce by allocating resources to digital planning, and e-commerce guidelines for catastrophe recovery and e-commerce crash points, such as the e-commerce crash during the Covid-19 crisis.

7.4. Contributions of the study

The findings from this study have added to and supplemented existing lines of research on the impact of Covid-19 on business, especially SMEs. It also provides a unique contribution to the literature in that it offers a mixed-methods approach, based on the RBT theory and dynamic capabilities theory, in the e-commerce retail industry during the Covid-19 pandemic. Therefore, the findings and recommendations from this study can be considered as the initial step towards providing a more insightful evaluation. It is among the few studies that has taken a holistic approach, by not only using a mixed methods research approach, but also considering each of the e-commerce resources in one study and evaluating how the representatives of dynamic capabilities strengthened the resources individually.

The closed-ended questionnaire didn't provide that open platform for SMEs to explain the accurate experiences and complexities. The Covid-19 pandemic created an ever-changing environment and due to the uncertainty of sudden lockdown regulations, it impacted businesses differently throughout the pandemic. As the environment and regulations changed, so did the growth in e-commerce business. Therefore, the stronger part of this study is certainly the interviews as they captured the entire Covid-19 pandemic and not just a single point in time.

The value of this contribution may be realised when considering that e-commerce constructs have been largely investigated; however, after the Covid-19 pandemic, the literature has lacked perspectives on the new and recent challenges that were brought about by the pandemic. Therefore, the understanding and analysis of the relationships between the e-commerce resources and capabilities is valuable for advancing the knowledge in this field.

Concerning theoretical contributions, the researcher used representative constructs of the RBT and dynamic capabilities theory to design the conceptual model, hypotheses and interview questions. This study contributes to the body of knowledge by showing the confirmed and non-confirmed relationships between the e-commerce resources and skills. It is observed that due to the pandemic, some of the results in the regression analysis were different from what was expected, and during the interviews, a profound understanding of those relationships emerged. Therefore, based on the findings, an adjusted conceptual model was proposed as shown in Figure 7.1 below:

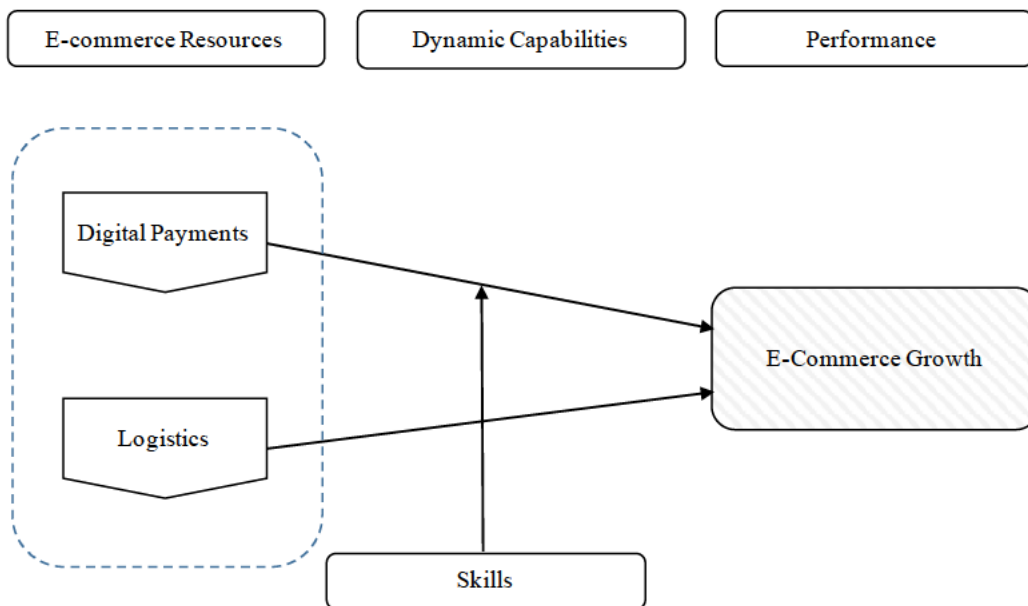


Figure 7.1: Proposed framework

Source: Developed by researcher from research findings

Furthermore, this study has provided the fundamental information, rationale and inspiration for contributing new visions and findings in the area of e-commerce practices among SMEs during a pandemic. The study has confirmed that substantial research in the field of e-commerce has been conducted and is accessible. However, the complexities of Covid-19 have altered e-commerce for businesses drastically.

From a scholarly perspective, this study:

- provides a context-rich, mixed-methods investigation of the phenomena of the impact of Covid-19 on e-commerce among SMEs during the pandemic, in the retail business, adding to the body of knowledge.

- makes an important contribution to the e-commerce literature by providing insight into how a global pandemic with lockdown regulations impacted the e-commerce businesses and the growth of e-commerce.
- through qualitative research, established that there is a lack of digital skills among SMEs and identified the importance of e-commerce skills in a business.
- through quantitative research, showed that broadband usage had a negative impact on e-commerce growth during the pandemic. It has also highlighted that some owners were not fully aware of how to use their e-shop and its features efficiently, streamline the entire process, and were not doing enough to manage the problem effectively.

This study has practical implications as well.

- SMEs should invest in digital skills training for themselves as owners and then the staff. However, specific consideration should be given to the appropriate operating systems that ensure the infrastructure to support business needs.
- By better understanding the causes of internet disruptions with speed and connectivity, they can seek professional and expert advice on efficiency of Wi-Fi routers and obtain a good internet infrastructure.
- Take advantage of government business loans and invest in greater resources and capabilities, by also hiring the right skilled workforce.
- Seek professional advice on the type of cybersecurity measures that should be in place.
- Drone deliveries would need government infrastructure and policies need to be in place.
- The recommendations focus on optimisation, improvement and upgrading of processes to keep up with the latest technology.
- Understand the principles required to use the digital skills to complement the business model, for instance, what unique assets and expertise are required to develop the strategy for change.
- How to change operations to expand scale and knowledge opportunities of digital skills in the business.

The recommendations and contributions presented show the complexity of the problem of e-commerce during a pandemic. The limitations are described next.

7.5. Limitations of the study

Considerations for further studies emanated after concerns arose including responses from a single location and industry.

- i. Firstly, this study was conducted in the city of Edenvale, Gauteng, South Africa, and not nationally. Whilst a local study identifies trends, at a national level it is required to present a better understanding of the impact of Covid-19 on e-commerce among SMEs during the pandemic in South Africa. For example, the rest of Johannesburg, which is the rest of the economic hub of South Africa or Cape Town, was excluded from this study. The resources and capabilities may differ among businesses across Johannesburg and Cape Town, and thus are different from Edenvale, which could provide a different perspective.
- ii. Secondly, the study was limited to the retail industry that had an online presence, as the study wanted to investigate the challenges SMEs had with the usage of e-commerce, by considering how their capabilities supported their migration to electronic commerce.
- iii. Thirdly, even though the research topic has been thoroughly examined, the holistic approach this study pursued towards the e-commerce resources to develop the conceptual model was not a reproduction of other existent models.

7.6. Recommendation for future studies

Taking into consideration the limitations of the study, the areas mentioned could be explored in future research to advance the field of e-commerce during a pandemic. With regards to South African literature, this study focused on SMEs in the Gauteng province. It would be interesting to determine if the findings of this study can be generalised to the rest of the population of South African SMEs. Thus, a cross-sectional study which includes participants from other provinces could be valuable to validate whether the outcomes of this study could be generalised to the wider population of South African SMEs.

Furthermore, as mentioned earlier in the limitations of the study, the target population was the retail industry only which had an online presence during Covid-19. Future studies could be specific on what type of retail industry to investigate. Additionally, this study took a holistic approach and considered all the e-commerce resources to conclude an e-commerce transaction from a business perspective. Future studies could study each construct separately with the recommended moderating variable, to evaluate the individual resource's impact on

business performance. Moreover, this study's questions were conducted during the Covid-19 pandemic, whereas future studies could be done after all businesses are settled down from the aftermath of Covid-19.

7.7. Conclusion

This study was conducted in response to the resurgence of e-commerce due to the Covid-19 pandemic. Considering the growth of e-commerce in South Africa due to the Covid-19 pandemic, e-commerce challenges were amplified among SMEs due to their resources and capabilities. This study addressed the gap in the knowledge by investigating how e-commerce resources influence the growth of e-commerce, and how the capability of the business strengthens the relationship between the resources and growth of e-commerce during the Covid-19 pandemic. Consistent growth of SMEs is critical to the health of the national economy. Global SMEs faced a number of threats to their viability as a result of the pandemic and its containment measures, including blocked logistics, a broken supply chain and labour shortages. The uncertainty created by the pandemic made the most vulnerable SMEs fight for their survival and future development, thereby emphasising the need for advancement of technology.

Based on this premise, this study surveyed and interviewed SME owner/managers to examine the e-commerce resources and capabilities, and the impact on the performance of their online business. SMEs were chosen to participate in the study as they are the bedrock to the nation's economy. Through the findings, it became evident that there were uncertain times as some results differed among SMEs. This study, therefore, argues that investment in effective e-commerce resources, in tandem with investment in capabilities to strengthen the usage of the resources, had a positive influence on the growth of e-commerce during the pandemic.

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APPENDICES

APPENDIX A: QUESTIONNAIRE

The Impact of Coronavirus on Electronic Commerce among Small and Medium-sized Enterprises in Gauteng

To whom it may concern

My name is Atlanta Ramsern, and I am a doctorate student at the University of Kwa-Zulu Natal, Graduate School of Business. My email address is 213572116@stu.ukzn.ac.za and my phone contact detail is: 0829206230.

I am requesting your voluntary and anonymous participation in a research study which is being conducted towards my doctorate which is titled: The Impact of Coronavirus on Electronic Commerce among Small and Medium-sized Enterprises in Gauteng.

The primary aim of this research is to assess and critically understand the challenges that SMEs faced with e-commerce during the pandemic. An email will be sent out to each retail SME with a link to the questionnaire. It would take you approximately 10 minutes to complete the questionnaire.

This study has been approved by the UKZN Humanities and Social Sciences Research Ethics Committee (approval number HSSREC/00004626/2022).

In the event of any concerns/questions you may contact the researcher at 0829206230 or the UKZN Humanities & Social Sciences Research Ethics Committee, contact details as follows:

HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS ADMINISTRATION

Research Office, Westville Campus Govan Mbeki Building

Private Bag X 54001

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KwaZulu-Natal, SOUTH AFRICA

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Email: HSSREC@ukzn.ac.za

Your participation in this study is entirely voluntary and you may withdraw from participation at any time. If you decide to take part in this study, you will be asked to click yes at the bottom of the consent form. After you sign the consent form, you are still free to withdraw at any time and without giving a reason. If you withdraw from the study before data collection is completed, your data will be returned to you or destroyed.

The data received will be safe and secure using the following methods:

1. The data will be encrypted
2. There will be limit access to only those that require it and have been identified within an approved protocol
3. The researcher will conduct periodic access reviews
4. The researcher will follow Minimum Use guidelines
5. The researcher will not e-mail data without encryption
6. The researcher will ensure a strong password is in place and change it regularly

CONSENT

I have been fully informed about the study entitled The Impact of Coronavirus on Electronic Commerce among Small and Medium-Sized Enterprises in Gauteng by Atlanta Ramsern. I understand the purpose of the study and I declare that my participation in this study is entirely voluntary and that I may withdraw at any time without affecting anything.

I hereby consent to be a participant for the research study titled: The Impact of Coronavirus on Electronic Commerce among Small and Medium-Sized Enterprises in Gauteng

Yes	<input type="checkbox"/>
No	<input type="checkbox"/>

For each question, select the ONE response option that best applies to you.

SECTION A: General information

1 The gender you were assigned at birth

Male	Female
<input type="checkbox"/>	<input type="checkbox"/>

2 Your age group

Up to 29	30-39	40-49	50-59	60+
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3 Your highest qualification

Matric	Diploma	Degree	Masters	Doctorate

4 In which ONE of the following retail industries does your business operate MOST?

Office Supplies and home furniture	Vehicles and Transport	Manufacturing and Distribution	Electrical, gas and water supply	Electronics and Computing
Pharmaceutical	Sports and gym equipment	Food and drink	Jewellery, watches, accessories	Clothing, shoes and toys
Health and beauty	DIY and tools	Animal and pet supplies		

5 How many employees are there in your business?

Less than 5	5 -50	51 - 100	101 – 250

6 Which department of your business has been most affected by Covid-19?

IT	Marketing	Supply Chain management	Logistics	Human Resources	Other

If you selected OTHER, Indicate your department _____

SECTION B: Internet/Broadband usage

Indicate your level of agreement with the statements regarding internet usage in your business **DURING the Covid-19 pandemic:**

	During Covid-19, my business used the internet for...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
BU1	Internal communications (emails, webinars, newsletters, product info etc)					
BU2	Business meetings					
BU3	Payments					
BU4	Promotions					
BU5	Sales					
BU6	External communication with customers/suppliers					
BU7	Video conferences					
BU8	Videos of products/services					
BU9	Staff training sessions					

Indicate your level of agreement with the following statements regarding internet usage in your business **DURING the Covid-19 pandemic:**

	During Covid-19...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
BU10	There were direct computer-to-computer links with key suppliers					
BU11	Inter-organisational coordination was achieved using electronic links					
BU12	We used information technology-enabled transaction processing					
BU13	We had electronic mailing capabilities with our key suppliers					
BU14	We used electronic transfer of purchase orders, invoices and/or funds					
BU15	We used advanced information systems to track and/or expedite shipments					

SECTION C: Skills set

Indicate your agreement that, DURING the Covid-19 pandemic, there were employees in your organisation who had the following skills required for digital business operations:

	Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
IS1	Operational internet skills like saving, uploading, and downloading files including image, audio, and video					
IS2	Formal internet skills like navigating through websites effectively					
IS3	Information internet skills like checking and retrieving information that you need					
IS4	Strategic internet skills used to make decisions on retrieved info and financial benefits					
IS5	Soft skills such as communicating and managing staff digitally					
IS6	Content writing skills					
IS7	SEO skills (analyzes, reviews and implements changes to websites so they are optimized for search engines)					
IS8	Technical skills – ability to use computer-based technology to complete different tasks e.g. receiving payments digitally					
IS9	Using social networking tools					
IS10	Understanding privacy issues					

SECTION D: E-shop features

Indicate your level of agreement with the following statements:

	DURING the Covid-19 pandemic...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
ESF1	Our e-shop platform provided accurate information					
ESF2	The information provided on our e-shop platform was reliable					
ESF3	The information provided on our e-shop platform was clear and easy to understand					
ESF4	Our e-shop platform contained all information that was needed for the purpose of a purchase decision					
ESF5	There was enough information on our website about the e-shop and its products					
ESF6	Our e-shop design was creative					
ESF7	The start page of our e-shop easily lead customers to the information they needed.					
ESF8	It was easy to move around on our e-shop platform					
ESF9	Our e-shop platform used a good colour combination.					
ESF10	Our e-shop platform loaded quickly.					
ESF11	The transaction process on our e-shop platform was easy and quick					
ESF12	We invested time and/or money in improving the features of our e-shop					
ESF13	Our business used e-shop features to communicate with customers					
ESF14	Our business used e-shop features to share information with the customers					

ESF15	Our business used e-shop features to build relationships with customers					
ESF16	Our business used e-shop features to manage customer needs					
ESF17	Our business used e-shop features to feel close to customers					

SECTION E: Digital marketing strategies

Indicate your level of agreement with the following statements:

	DURING the Covid-19 pandemic...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
DMS1	We had clearly defined parameters for measuring the performance of our website					
DMS2	We knew what visitors were doing on our website					
DMS3	We knew how many visitors to our website became our customers					
DMS4	We knew what percentage of visitors came to our website through various online channels (Facebook, Google ads, display ads, search engines)					
DMS5	We used web analytics to know which type of guests were looking for which type of product during the pandemic					
DMS6	Our business had a digital marketing plan with clearly defined activities, responsible executors, and a budget for each activity					
DMS7	Our digital marketing plan was an integral part of our marketing plan and was created using the set goals					
DMS8	We held several meetings throughout the pandemic to prepare a digital marketing plan					
DMS9	Our business had adequate technical support for the implementation of digital marketing activities					
DMS10	People with knowledge in the field of digital marketing were responsible for the implementation of digital marketing					
DMS11	Activities of all employees in the business, as well as external collaborators (IT experts) who were responsible for the implementation of digital marketing, were well coordinated					

SECTION F: Digital payments

Indicate your level of agreement with the following statements:

	DURING the Covid-19 pandemic...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
DP1	We accepted diverse payment methods					
DP2	Our digital payment process was easy for customers of all ages and abilities to use					
DP3	The order and delivery details of the customer were clearly stated on our payment page					
DP4	Our digital payment process sent a confirmation of payment to the customer					
DP5	Our checkout process flow was easy and trustworthy					
DP6	Our payment form was clear and concise					
DP7	Our digital payment process sent automated payment invoice to the customer					
DP8	Our business monitored payment notifications and reports					
DP9	Our business implemented mobile app payments					

SECTION G: Cyber security

Indicate your level of agreement with the following statements:

	DURING the Covid-19 pandemic...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
CS1	Our business did regular backups which included files and data in general					
CS2	Our business was aware of the data we had and the risk of having it					
CS3	Our staff were trained to recognize suspicious notifications					
CS4	Our business limited employee access to sensitive info					
CS5	Our IT systems had appropriate firewall and antivirus technology					
CS6	Our business had the necessary security settings in place to protect browser and email programs that met business needs without increasing risk					
CS7	Our business had data breach security tools					
CS8	The data breach security tools were monitored regularly					
CS9	Our business updated security software in a timely manner					
CS10	Our business had security capabilities to avoid attacks					
CS11	Our business had plans in place to manage data breaches					
CS12	Our business was protected with insurance coverage designed to address cyber risks					

SECTION H: Logistics services

Indicate your level of agreement with the following statements:

	DURING the Covid-19 pandemic...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
LS1	Our business always delivered the correct/accurate product to the customer					
LS2	Our business always delivered to the exact address/destination of the customer					
LS3	Our business always delivered at the timeslot agreed upon with the customer					
LS4	Our business always delivered its products in acceptable condition					
LS5	The correct documentation always accompanied a delivery					
LS6	Our business always delivered to the right customer					

SECTION I: Logistics management

Indicate your level of agreement with the following statements:

	DURING the Covid-19 pandemic...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
LM1	Inter-organisational logistics activities were closely coordinated in our business					
LM2	Our logistics activities were well integrated with the logistics activities of our suppliers.					
LM3	We had a seamless integration of logistics activities with our key suppliers					
LM4	Our logistics integration was characterised by excellent distribution, transportation and/or warehousing facilities					
LM5	The inbound and outbound distribution of goods with our suppliers was well integrated					
LM6	Information and materials flowed smoothly between our suppliers and our business					

SECTION I: E-commerce performance/growth

Indicate your level of agreement with the following statements regarding the growth/performance of your e-commerce online business during the Covid-19 pandemic:

	Since the start of the Covid-19 pandemic...	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
ECG1	Our business has seen a growth in online sales					
ECG2	Our business has shown increased online profits					
ECG3	Our business has increased its online market share					
ECG4	Our online business revenue has increased					
ECG5	Our business has noted a rise in the number of online transactions					
ECG6	Our business has shown a rise in the number of online site visits					
ECG7	Our business has recorded a decrease in online shopping cart abandonment					

THANK YOU FOR YOUR TIME

APPENDIX B: INTERVIEW SCHEDULE

Semi-structured interview schedule: Qualitative Study

Can you tell me about yourself and your company?

Section 1: Broadband/Internet

1. What type of internet connection/broadband spectrum was your business using during the pandemic?
2. Did you experience any challenges with broadband/the internet through the pandemic? Please elaborate.
3. What impact did these challenges have on your business?

Section 1.1: Skillset

1. Were you forced to learn more about e-commerce (and 'up your game') during the pandemic?
2. Did your employees have the necessary skills for e-commerce business?
3. (If they answer no) How did you rectify this?
4. How important was it for employees to have e-commerce internet skills in your business?

Section 2: E-shop

1. What changes did you make to your e-shop platform during Covid-19?
2. How did you go about boosting your online presence?

Section 2.1: Digital marketing strategies

1. What digital marketing strategies did you develop to support your e-shop through the Covid-19 pandemic?

Section 3: Digital payments

1. What payment options were available for your customers to pay for online purchases?
2. Did you experience any challenges with your digital payment system during the pandemic? Please elaborate.

Section 3.1: Cybercrime management

1. Did your business or your consumers (while purchasing from you) experience cybercrime during the pandemic?
2. What has your business done to protect consumer data and fraudulent transactions?
3. Has this been effective in reducing cybercrime (If they have not had any crime, you would not ask this)

Section 4: Logistics services

1. Do you outsource your deliveries or was it done by your company during the Covid-19 pandemic?
2. Did your business experience any problems with logistics services during the pandemic? Please elaborate.

Section 4.1: Fulfilment management

1. Did you encounter any problems with managing your logistics (integration and suppliers) through the pandemic? Please elaborate.

Section 5: E-commerce Growth

1. Did the performance/growth of your online business (profit, sales, market share etc) improve or decline during Covid-19?
2. What external factors do you think contributed to this improvement/decline?
3. Were there any internal factors (regarding the business) that contributed to this improvement/decline?

Feelings Today: In retrospect, if we could turn back the clock to the start of the pandemic, what would you do differently regarding the business?

APPENDIX C: PROOF OF EDITING



JEANNE ENSLIN
FREELANCE LANGUAGE PRACTITIONER

Editing certificate

TO WHOM IT MAY CONCERN

Language editing

I, Jeanne Enslin, acknowledge that I did the language editing of Atlanta Ramsern's thesis submitted in fulfilment of the requirements for the degree Doctor of Business Administration at the University of KwaZulu-Natal.

The title of the thesis is:

THE IMPACT OF THE CORONAVIRUS ON ELECTRONIC COMMERCE AMONG SMALL AND MEDIUM ENTERPRISES IN GAUTENG

All corrections and changes are evident in the version of the thesis in track changes and with many comments – most just explaining my changes. Those that were for the student's attention, she has attended to.

The quality of the final document, in terms of language, formatting and references remains the student's responsibility.



Jeanne Enslin
Language editor
+264 812917040.

Technical editing

I, Ronel Gallie, acknowledge that I did the technical editing, checked/corrected all in-text references and the reference list, as well as did cross-referencing thereof, of Atlanta Ramsern's thesis submitted in fulfilment of the requirements for the degree Doctor of Business Administration at the University of KwaZulu-Natal. Detailed feedback has been provided.



Ronel Gallie
Technical editor
+2784 7780 292.

J H Enslin BA (US); STD (US); Hons Translation Studies (UNISA)

APPENDIX D: ETHICAL CLEARANCE CERTIFICATE



29 August 2022

Atlanta Govender (213572116)
Grad School of Bus & Leadership
Westville Campus

Dear A Govender,

Protocol reference number: HSSREC/00004626/2022
Project title: The impact of coronavirus on electronic commerce among small and medium-sized enterprises in Gauteng
Degree: PhD

Approval Notification – Expedited Application

This letter serves to notify you that your application received on 10 August 2022 in connection with the above, was reviewed by the Humanities and Social Sciences Research Ethics Committee (HSSREC) and the protocol has been granted FULL APPROVAL.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment/modification prior to its implementation. In case you have further queries, please quote the above reference number. PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

This approval is valid until 29 August 2023.

To ensure uninterrupted approval of this study beyond the approval expiry date, a progress report must be submitted to the Research Office on the appropriate form 2 - 3 months before the expiry date. A close-out report to be submitted when study is finished.

HSSREC is registered with the South African National Research Ethics Council (REC-040414-040).

Yours sincerely,

Professor Dipane Hlalele (Chair)

/dd

Humanities and Social Sciences Research Ethics Committee

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Founding Campuses: Edgewood Howard College Medical School Pietermaritzburg Westville

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