

E-Commerce Challenges of SMMEs In South Africa During the Covid-19 Pandemic

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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 the lockdown protocols and government restrictions. The sudden need by SMEs to change the operations model to e-commerce, became a major challenge. Many SMEs were 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 and services, digital payment, and logistics to the consumer. Thus, this study investigated the challenges experienced by SMEs when using e-commerce platforms during the Covid-19 pandemic. Through an extensive literature review, several hypotheses were postulated and data was collected from SME owners in Gauteng Province, South Africa to test them. Simple random sampling was used to identify participants for the survey and the questionnaires which were adaptation of previously developed ones were distributed via email to 307 retail SMEs in Edenvale, Gauteng. Inferential statistical analysis, through structural equation modelling, was used to analyse the data that was collected through the survey. 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.

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

Introduction

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 people and be less exposed to areas where there is high human 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 digitization. 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 SMEs could smartly digitize their business model and utilize e-commerce more effectively and efficiently in their operations. An exploratory 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). 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. Thus, the research aim was to critically evaluate the challenges faced with e-commerce among SMEs in South Africa during the pandemic.

Literature Review

The Covid-19 pandemic increased pressure on broadband and the use of e-commerce, since resilient and robust internet infrastructure are essential for e-commerce (Claffy et al., 2020; Mora, 2021). Although globally, the Covid-19 pandemic is in the third/fourth year, the gap still remains as the challenges of robust internet infrastructure to use e-commerce is far from over (Gupta et al., 2022). As the world of work has shifted to online rather than office-based, digitisation across all industries is accelerating and simultaneously creating a crucial need for strong internet connection to conduct business (Randell-Moon & Hynes, 2022).

Through the literature reviewed, it became apparent that without access to a reliable broadband, an SME cannot do business online (Majid et al., 2021; Mvambo, 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 worked from home they required 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 (Berners-Lee, 2020; Mota & Cilento, 2020). In order to explore the above further, it is hypothesized that:

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

Globally, the Covid-19 crisis forced SME personnel to alter their approach of working (operations model) 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). Even before the current crisis, changing technologies and new ways of working with e-commerce and its online platforms were disrupting jobs and the skills employees need to do them (Semerádová & Weinlich, 2019). 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 acquire new skills by 2030, because of 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 had a clear sense of how to deal with the problem (Agrawal et al., 2020; Carlisle et al., 2021; Singh et al., 2021).

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 workers to new responsibilities and tasks. This dynamic is about the role of advanced e-commerce platforms and in what way SME owners/managers can reskill and

upskill the staff to provide new business models in the post-pandemic era (Agrawal et al., 2020).

Alam et al. (2022) argued that SMEs faced 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 (Alam et al., 2022; Szyjewski, 2019). 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 (Alam et al., 2022; Szyjewski, 2019). Internet skills revealed its utmost importance in the support of the usage of broadband.

This is explored further by postulating that:

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

Through the Covid-19 lockdown, consumers expected 24-hour availability to respond to any concerns or questions they had about the product or service on an e-shop platform (Mofokeng, 2021; Pentz et al., 2020). However, many SMEs in South Africa did not invest sufficiently on their online shops to make for a seamless shopping experience (Mofokeng, 2021). 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, lack of general product information and delay in shipment (Camilleri, 2021). These communications could be 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-shops 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 easy pay options, payment of invoices online, managing their returns and discount structures (Galhotra & Dewan, 2020). Many SMEs had newly established an online presence during the Covid-19 pandemic, and lacked the basic features that attract consumers to their e-shop platform, damaging the search engines and impacting the growth of e-commerce. Thus, this study intended to explore the situation with respect to SMEs in South Africa by postulating that:

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

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 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 (Perbanga, 2021). Since digital marketing is considered to have a positive relationship with the sustainability of SMEs, especially through a crisis (Adam et al., 2020), several studies examined the influence of digital marketing efforts on SMEs in determining the growth of e-commerce during the Covid-19 pandemic (Thaha et al., 2021). The effect of digital marketing applications such as online advertising, affiliate marketing, email marketing, SMM, and SEO on the growth of e-commerce is positive (Nuseir & Aljumahb, 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). Thus, hypothesis 4 was developed to explore the relationship between e-shop platform and the growth of e-commerce among SMEs by postulating that:

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

The Covid-19 pandemic sharply increased the need for contactless digital payments systems. Payment used to be just a transactional point; however, it now represents an opportunity to engage with customers and enhance the total shopping experience (Gora, 2020) and differentiate from competition (Zuyeva et al., 2020). The difficulty with delivering that experience was intensified by the demand to adapt to diverse markets and payment preferences which are cost-effective (Gora, 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 online, in-store and mobile 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 team up with a payment partner with the skill to sustain a universal customer journey and utilise a convergent payment infrastructure, which is directly supported with tokenisation tech and could facilitate acceptance of payments through a solitary platform with a unified and reliable payment experiences across channels.

Researchers highlighted that trust was one of the driving forces influencing the 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

(De Girancourt et al., 2020; Zuyeva et al., 2020). Users with better understanding of the payment system and who could 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 enables them to sell, buy, rent and get paid more easily. Therefore, in order to examine the effect of digital payments on e-commerce, it is hypothesized that:

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

Before Covid-19, there were many concerns around cybercrime and making online payments and processing credit card transactions made the journey into e-commerce daunting (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, 2022). 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 around 130 billion dollars due to digital fraud between 2018 and 2023 (Jiang et al., 2021; Ncubekezit, 2022). 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 need to implement the essential tools and possess a safety approach that infiltrates the complete company culture. While the issues in digital payments are extensive, the pathway to continuous success are becoming more apparent (Ncubekezi, 2022).

Fraud remains a key challenge facing the payment industry, as well as an issue which can have a significant impact on both businesses more broadly as well as end consumers (Trawnih et al., 2021). Financial crime has seen an increasing trend in recent years and is one that is constantly evolving as criminals continue to get more sophisticated and more inventive with their approaches (Nabiebu & Akpanke, 2021). In response, new fraud prevention and detection methods and techniques have been developed and deployed. But this is a constantly changing game, with criminals adopting new strategies and the payment industry and other financial institutions deploying increasingly sophisticated techniques to stop them (Chigada & Madzinga, 2021).

Covid-19 created some degree of additional risk of fraud, as a result of an increase in online shopping including shoppers who have never previously shopped online in the past and are perhaps less familiar with some of the more obvious signs to be wary of (Ncubukezit, 2022). Criminals were aware of this and were happy to use this situation to their advantage. Unfortunately, there was no way to fully eradicate the risk of fraud. Trawnih et al. (2021) argued that payment providers continue to develop more refined fraud deterrence and recognition tools to reduce the incidence. 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 (Chigada & Madzinga, 2021; Nabiebu & Akpanke, 2021; Olofinbiyi & Singh, 2020). Accordingly, the effective management of cybercrime supports digital payments and hence, positively impacting the growth of e-commerce.

To explore this relationship further, it is postulated as follows:

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

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 (Joshi & Sharma, 2022; Li & Zhang, 2020). 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 shopping cart desertion rates. Forty-four percent of online customers who bail out of a purchase say that high shipping costs are the number one reason, and twenty-four percent of online customers cancel orders due to slow delivery speeds (Tilak, 2022). To further explore the impact of logistics on e-commerce growth, it was hypothesized that:

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

The Covid-19 pandemic revealed that several SMEs were vulnerable as they adopted a 'single-source' strategy in logistics (Ali et al., 2021; Ferreira et al., 2021; Mangano et al., 2022; Montoya-Torres 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). Logistic firms were unable to fulfil all orders timeously during the Covid-19 pandemic as the demand was too high (Ali et al., 2021; Ferreira et al., 2021; Montoya-Torres 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 and anxiety caused by Covid-19 was taking its toll on 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 delays in supply due to bottlenecks in the companies'

own logistics networks (Montoya-Torres et al., 2021; Sudan & Taggar, 2021; Witkowski et al., 2020). Furthermore, the mechanisms to solve these challenges were largely inaccessible, and the remaining options were taking longer or were more expensive (Joshi & Sharma, 2022; Rahman, 2022; Winkelhaus & Grosse, 2020).

Heck (2020) argued that the dispatch to the end consumer is an additional critical accomplishment factor for e-commerce retailers in the logistics fulfilment process 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. It is against the above that H 8 was developed as follows:

H8: Fulfilment management moderates the relationship between logistic services and the growth of e-commerce among SMEs during the pandemic.

The research design and methodology used to test the various hypotheses postulated above is explained below.

Research Methodology

An on-line survey was used to collect quantitative data which addressed the research questions and objectives. The population for this study comprised the SME owner/managers in the Edenvale area, Gauteng. The target population 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%. The on-line survey link was sent to all 307 retail SMEs in the Edenvale area.

Predeveloped questionnaires were used and the items were adapted from the sources reflected in Table 1.

Table 2: 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 ; Mohamedata et al., 2018

Source: Developed by researcher

There were 98 questions in total, separated into ten categories on the questionnaire. Section A included the demographics of the respondents and 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, where 1=Totally Disagree and 5 =Totally Agree.

Research Findings

Response rate

The questionnaire was sent out through a google form link, to 307 SMEs in the retail industry. The sample size calculated was 171, and after several reminders, 212 completed questionnaires were

received. Most of the respondents were male (70.8%) in comparison to female (29.2%). The respondents in the 30-39 years age group were most represented, followed by those in with age group of 40-49 years.

The majority of the respondents had between 5-10 employees (43.4%), and 27.4% of the respondents had less than 5 employees. The largest affected department amongst all the SMEs that participated in the survey was the IT department (22.6%), supply chain management (21.7%) and the logistics department (21.2%).

Figure 1 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%).

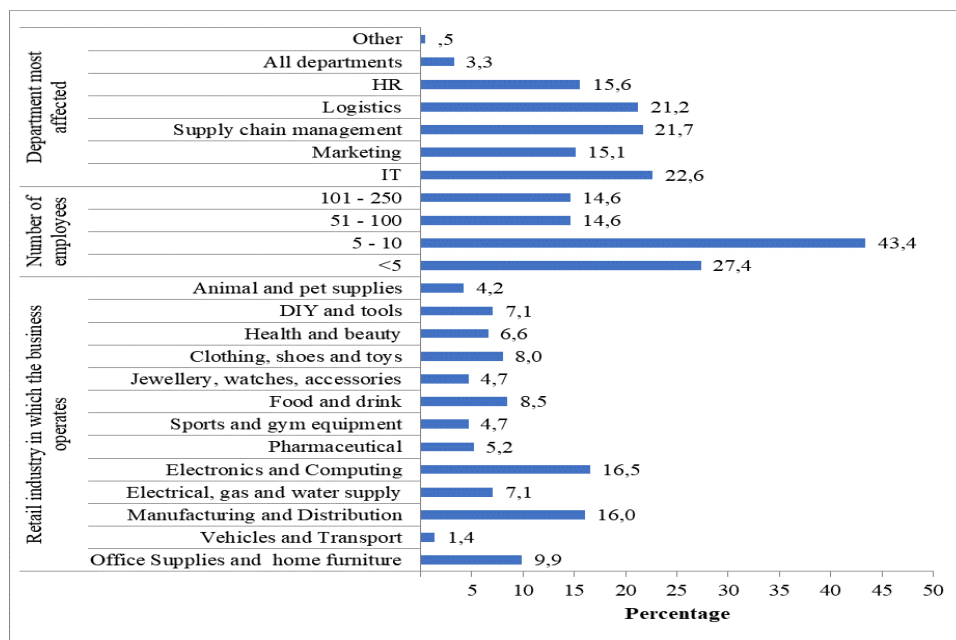


Figure 1: Composition of the sample

Factor analysis

In order to ensure construct validity factor analysis with promax rotation was applied. The output is reflected in Table 2.

Table 2: Output of 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			
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 Measure	.938					
Bartlett's test – p-value	15480.095 (<.001)					

Structural Equation Modelling

A two-stage process was used in conducting the SEM, the first stage was about the measurement model. Firstly, confirmatory factor analysis (CFA) was conducted to explore the measurement of the latent constructs achieved using the measured variables and 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. Thereafter, the measurement model derived from stage 1 was converted into a path model that showed the relationships between the latent variables. This path model was then used to test the effect of the independent variables on the dependent variable.

Table 3 shows all the variables in the initial stage as well as the variables which were retained in the final model. The Table reveals the factor loadings from the initial measurement model and from the final measurement model once items were dropped to attain validity and reliability, as well as to get an acceptable model fit.

Composite reliability represented the shared variance among a set of observed indicators measuring an underlying factor (Shrestha, 2021). This researcher argues that for reliability to be attained, the composite reliability (CR) must be greater than 0.7 and all loadings must be greater than 0.5. Furthermore, for convergent validity to

be attained, the CR must be greater than the average variance extracted (AVE), and AVE must be greater than 0.5).

Discriminant validity was assessed by using the Fornell-Larcker (1981) criterion, which defines the discriminant validity of the variable as the average variance extracted (AVE) values for all constructs.

Based on the results reflected in Tables 3– 8, it can be concluded that reliability, convergent and discriminant validity were all achieved for both initial and final loadings for all the research constructs.

Table 3: 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

Table 4: 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

Table 5: 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	

Table 6: 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	0.975
Average variance extracted (AVE)			0.765	0.767
Maximum shared square variance (MSV)			0.638	0.638

Table 7: Measurement model for Skills

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 eg. 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

Table 8: 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

Table 9 reveals that the model fit was acceptable for final solution and therefore, final measurement model was accepted.

Table 9: Model fit

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
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This final accepted model as reflected in Table 10, was then taken forward to the second stage of SEM, which was the path analysis.

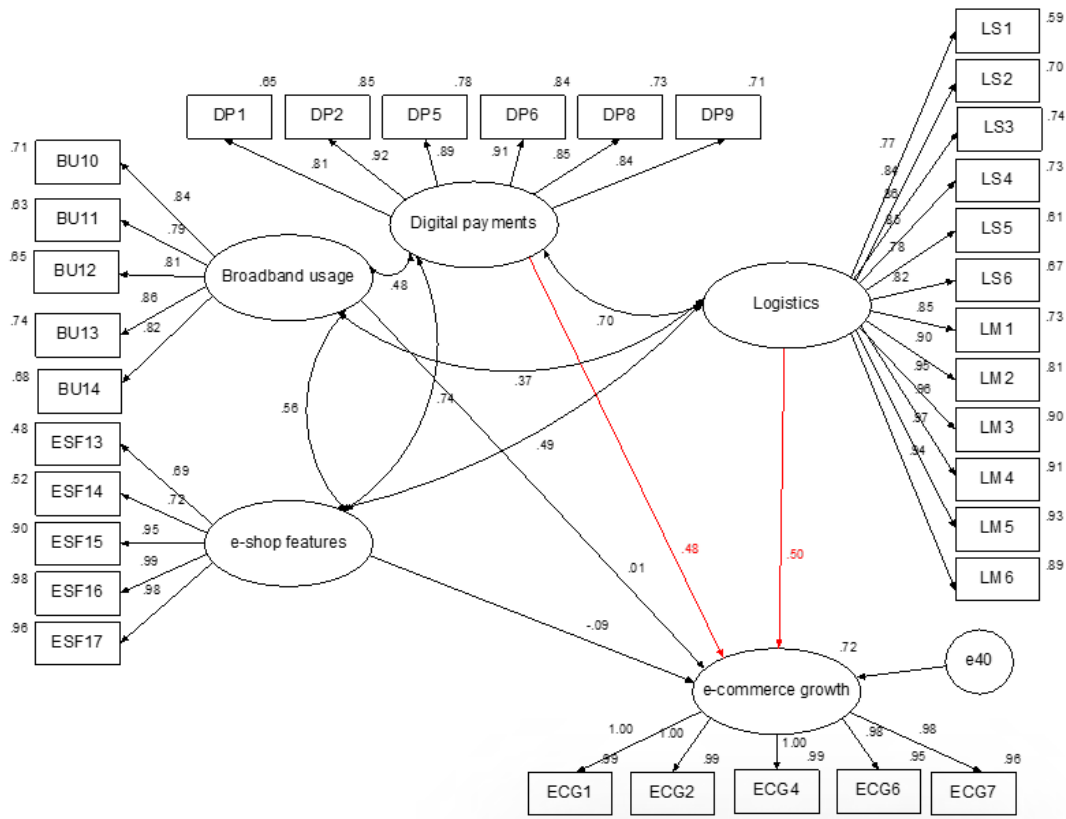
Table 10: Structural model

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
Fit Indices	Fit values	Criteria	
χ^2 / df (p-value)	2.251 (<.001)	<5	
IFI	0.951	>.9	
CFI	0.951	>.9	
RMSEA	0.077	<.08	

The model fit indices reflected in Table 10 above indicate an acceptable fit. In addition, both DP and LOG are significant predictors (positively influence) of e-commerce growth (ECG). These results are used to address the hypotheses

regarding the effect of the four independent variables on the dependant variables, ignoring any moderating effects. The outcome of the process is captured in Figure 2.

Figure 2: SEM



Based on the p-values depicted in Figure 2, the decision on the hypotheses postulated are captured in Table 11.

Table 11: Summary of the key findings

Hypothesis	Result
H1: Broadband usage positively influences the growth of e-commerce among SMEs during the Covid-19 pandemic.	Rejected
H2: Skills moderates the relationship between broadband and the growth of e-commerce during the Covid-19 pandemic.	Rejected
H3: Features of the e-shop platform positively impact the growth of e-commerce among SMEs during a Covid-19 pandemic.	Rejected
H4: Skills moderate 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 influence the growth of e-commerce among SMEs during the Covid-19 pandemic.	Accepted

H6: Skills moderates the relationship between digital payments and the growth of e-commerce among SMEs during a pandemic.	Accepted
H7: Efficient logistics positively impact the growth of e-commerce among SMEs during the pandemic.	Accepted
H8: Skills moderates the relationship between logistic services and the growth of e-commerce among SMEs during the pandemic.	Rejected

Source: Developed from Research Data

Discussions of the findings

The Impact of Broadband usage on the growth of e-commerce

According to research (Mvambo, 2021), the first step to the 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 et al., 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 prior, 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 effected

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). Hence, in concurrence with Denga (2023), there is a critical need for businesses that leverage their investments in e-commerce to unique internet-enabled capabilities to achieve the business's overall e-commerce effectiveness. Denga et al. (2022), claimed that the costly-to-copy attributes of e-commerce internet capabilities are tightly connected to the resource base and embedded in the business process of the firms, but the degree varies due to the firms themselves are unique with respect to their resource endowments.

The impact of E-shop features on the growth of e-commerce

H3 stated that the features of the e-shop platform positively impact 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) do not significantly impact the e-commerce growth during the pandemic. These findings are contrary to the research conducted 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 represented 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), since the aforementioned researchers argued that the 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 its own was tested, and concluded to not have a significant impact on performance.

It can be assumed that during the Covid-19 pandemic, SMEs tried to save cost 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 Impact of Digital payment system on the growth of e-commerce

H5 which postulated that digital payment systems influence the growth of e-commerce among SMEs during the Covid-19 pandemic was supported in the findings of this study. 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 (Chaveesuk et al., 2022; Odeh & Yousef, 2021; Sigalov et al., 2021).

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 payments 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.

The impact of Logistics on the growth of e-commerce

H7 postulated that efficient logistics positively impact the growth of e-commerce among SMEs during the pandemic. The results of the regression analysis confirmed that logistics significantly predicts the growth of e-commerce during the pandemic. From the literature, (Abbas et al., 2019; Montoya-Torres et al., 2021), it became apparent that logistics is represented as a valuable, rare and inimitable resource, where specific sets of resources are bundled into precious, scarce and hard to imitate capabilities, and this has been demonstrated to be helpful for explaining why some companies have been better

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 can be corroborated by Mohamed et al. (2008), who argued that the back-end functionalities such as logistics services and integration, order fulfilment and inventory management, was tested and supported that it significantly impacted business performance through e-commerce usage. These findings are consistent with Kembro et al., 2018; Leung et al., (2020), 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's (2022), who emphasized 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 higher front-end functionalities should work in synchronisation with higher back-end integration in order to significantly influence e-commerce growth. Furthermore, Mohamed et al. (2018), argued that back-end integration is found to have a much stronger impact on firm performance than front-end functionality, highlighting the importance of it to e-commerce, which appeared coherent with resource-based theory. Many studies concluded that back-end integration have a greater contribution to growth or performance, than front-end functionalities, because back-end integration is different for each business and difficult to imitate (Mohamed et al., 2018; Uwizeyemungu et al., 2022). Kembro et al. (2018) also claimed that back-end integration assists e-commerce businesses develop the capability to link divided resources together, causing increased integration and complementarities among disparate systems, which is strengthened by the internet connectivity and network integration.

The underlying rationale for the impact of logistics on the growth of e-commerce, would be that businesses in under-developed 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). E-commerce businesses are more differentiated by back-end integration because it is often tailored to a business's strategic context and is woven into the business operations, which is not transparent to competitors.

Skill Sets

Although 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, only H6 was accepted, and it was concluded that skills set significantly moderate the relationship between digital payments and e-commerce growth. 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 transform (Karadag, 2019).

With regard to H2, which postulated that skills moderate the relationship between broadband and the growth of e-commerce during the Covid-19 pandemic, the findings were not significant. These findings are contrary to that 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, 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. 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 an

uncertain and ever-changing times for most businesses.

With regards to H4, which suggested that skills moderate the relationship between the e-shop platform and the growth of e-commerce among SMEs during the Covid-19 pandemic, was not significant. Mohameda et al. (2018), reported findings similar to the findings of this study and they postulated that 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 are 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.

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 low internet skills 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 of 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 less 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 moderate the relationship between logistic services and the growth of e-commerce among SMEs during the pandemic. This postulation was not supported and the results are contrary to that reported from other studies, where some researchers assert that

the higher the dynamic skills capabilities, the stronger the relationship between logistics and e-commerce growth (Mohameda et al., 2018; Witkowski et al., 2020; 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, 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.

CONCLUSIONS AND RECOMMENDATIONS

It was very evident from 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 internet speed and connectivity challenges impacted businesses in various ways which can be summarized 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. Furthermore, regression analysis showed that digital skills were not significant to strengthen the relationship between broadband usage and e-commerce growth during the pandemic, as there were too many external factors that were a greater contribution.

It was noted that very basic the e-shop features were and there was a need for skills development and improvement of this knowledge among SMEs to capitalise on advanced digital marketing strategies, to support the relationship between the e-shop platform 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. Therefore, the management of cybercrime strengthened the use of digital payment portals and e-commerce growth. It also revealed through the regression analysis that a

low level of skill strengthened the relationship between digital payments and e-commerce growth.

It was ascertained that efficient logistics positively influenced e-commerce growth. This study has shown that the capability to use e-commerce resources effectively was a problem faced by SMEs, during a pandemic. Although 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.

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.

Based on the key research findings, the following are recommended:

- it is more important for SMEs to have consistent and reliable broadband connection to avoid business paralysis and the option of having two or more connectivity streams seems to be a sensible strategy to ensure seamless operations, efficiency and exponential business growth.
- upgrade to Wi-Fi routers that accommodate for higher internet speed and better signal.
- Invest in proper e-shop features
- Invest in paid digital marketing to increase website traffic
- Use third party payment portals
- Explore various payment solutions 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 cyber-crime and improve consumer accountability.
- Train staff to recognise breaches in security
- Create trust to use e-shop platforms to ensure the safety and security of personal and financial details of their business websites by adopting suitable monitoring measures.
- Adopt Centralisation of warehouse and distribution
- Invest in Enterprise Resource Planning
- Extended isle and fourth-party logistics can considerably reduce overhead and inventory costs. Many original equipment manufacturers (OEM) provide a 'skin' interface to the SME's site.
- Ensure employees are trained with the right ecommerce jargon, methods and management that will yield growth in any SME.

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