Assessing the Factors Underlying the Adoption of E-Commerce Among B2B SMEs:
A Two-Country Study

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ABSTRACT

This research examines the key factors of e-commerce adoption by South African and Nigerian B2B SMEs using a multi-perspective model that combines elements in the technological, organisational, and environmental contexts of the firms. Survey data for the research model were randomly collected; 700 were B2B SMEs in South Africa and Nigeria. A partial least squares structural equation model technique using the SmartPLS was applied to validate the measurement model and to assess the theorized relations. Results of the analysis showed that while some factors robustly predict the adoption of e-ecommerce by Nigerian and South African SMEs, other factors exclusively influenced either Nigerian B2B firms' adoption of e-commerce or South African B2B firms adoption of e-commerce. The findings highlight the importance of context-specific understanding of the drivers of e-commerce adoption among B2B firms in emerging African economies. It also outlines practical implications for promoting the adoption of e-commerce among B2B firms.

KEYWORDS

INTRODUCTION

Electronic means of advertising, communicating, buying, selling, and making payments are increasingly becoming the business norm. This growth is evident in the year-on-year increase in firms migrating to electronic commerce platforms for business operations. In 2019, e-commerce retail sales grew by 23.3% and were expected to represent 13.7% of global retail sales in 2024 (Stir & Zaiţ, 2019; Hwangbo et al., 2020). The rapid implementation of e-commerce platforms has led businesses to streamline their operations and improve their sales (Raimi & Uzodinma, 2020). Indeed, a study by Alsaad et al. (2018) reports that enterprises that have adopted Busines-to-Business (B2B) e-commerce in their business operations have seen an increase in sales compared to their counterparts that have not.

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So, it is abundantly evident that both small and large businesses must employ e-commerce to survive rather than as a choice (Liu et al., 2021). Previous research demonstrates that B2B SMEs cannot become competitive and maintain profitability without adopting innovation at the appropriate market levels (Alsaad et al., 2019; Chiniah et al., 2019; Huang & Chang, 2019; Haryanti & Subriadi, 2020). However, research has revealed that B2B SME owners tend to be overly cautious regarding the application and implementation of innovation (Alsaad et al., 2019). Liu et al. (2021) pointed out that SMEs, which frequently lack the means to use traditional forms of trade, can benefit from the efficient adoption and application of e-commerce methods.

To overcome the inertia hindering the adoption of e-commerce among B2B SMEs, it is imperative to conduct research in this area. Consequently, e-commerce adoption has become an attractive area of research among scholars (Susanty et al., 2020; Ahluwalia &Merhi, 2020; Orji et al., 2022; Wirdiyanti et al., 2022; Zhang et al., 2022). Despite the growing interest, it has been acknowledged that studies on e-commerce adoption among SMEs are scattered across different disciplines. Thus, further research is needed to examine the behavior of SMEs towards adopting e-commerce (Barkatullah, 2018; Oliveira et al., 2019; Chiniah et al., 2019; Huang & Chang, 2019; Haryanti & Subriadi, 2020). Therefore, the present study identifies several critical gaps in the literature that it aims to address.

First, research on SMEs must advance through theoretical development and empirical analysis. Advancing consensus on theoretical foundations of inquiry would contribute to emerging widely accepted concepts currently limited in the literature (Berente et al., 2019; Chiniah et al., 2019; Lai & Hwang, 2021). Such research is crucial as it deepens the understanding of e-commerce adoption. The dominant framework employed in the literature is the Technology-Organization-Environment (TOE) framework proposed by Tornakzky and Fleischer (1990). However, this framework has several limitations, including generic constructs instead of contextual drivers (Alsaad et al., 2019; Usman et al., 2019; Haryanti & Subriadi, 2020; Ugwuanyi et al., 2020; Azam et al., 2021). Therefore, scholars often adapt the constructs according to the specific study context, incorporating other theories to enhance rigor (Alsaad et al., 2019; Sipahutar et al., 2020; Haryanti & Subriadi, 2020; Mullins & Cronan, 2021, Ayawei, 2022). Moreover, some constructs exhibit inconsistent findings across different studies, indicating the potential existence of other factors.

Considering the inadequacy of the TOE model alone in providing a comprehensive understanding of SMEs' e-commerce adoption behavior (Alsaad et al., 2018; Alene, 2020), researchers have increasingly called for a more holistic approach that combines multiple theoretical perspectives to comprehend innovation adoption decisions (Mohtaramzadeh et al., 2018; Hussein et al., 2019; Ocloo, 2020). In response to this call, the present research integrates three theoretical frameworks - the TOE framework, diffusion of innovation (DOI) theory, and institutional theory - to develop a holistic conceptual model that enhances the understanding of B2B e-commerce adoption among South African and Nigerian SMEs. By integrating these frameworks, the study aims to provide improved theoretical lenses for understanding e-commerce adoption behavior, encompassing a more comprehensive set of factors relevant to SMEs' e-commerce adoption behavior compared to the original constructs of the traditional TOE framework (Abed, 2020; Ocloo et al., 2020).

Second, the literature review reveals a dearth of research on innovation adoption, specifically at the B2B SME level. Most studies on innovation adoption at the SME level are based on B2C firms, and findings from B2C firms cannot be generalized to B2B firms due to notable differences (Zain et al., 2020; Islam et al., 2021; Thuy, 2022; Ju & Tang, 2022). Consequently, there is a need for studies that specifically focus on understanding e-commerce adoption behavior in B2B firms. This research aims to address this gap by explicitly examining the adoption of e-commerce among B2B SMEs in Nigeria and South Africa. The present study aims to develop and evaluate a multi-perspective framework that identifies determinants influencing e-commerce adoption among B2B SMEs in Nigeria and South Africa.

Firstly, from a theoretical standpoint, this study proposes a multi-perspective framework encompassing various aspects relevant to B2B SMEs' inclination to adopt e-commerce. This

comprehensive framework enables researchers to gain a more thorough understanding of the variables influencing B2B SMEs' adoption of e-commerce in a developing country. Secondly, from an empirical perspective, this study evaluates the multi-perspective model using a sample of B2B SMEs from South Africa and Nigeria, two developing nations. Despite significant differences between advanced and developing countries, most e-commerce adoption studies have primarily focused on developed nations. Therefore, generalizing findings from industrialized countries to the circumstances of developing countries is challenging (Barkatullah, 2018; Oliveira et al., 2019; Chiniah et al., 2019; Huang & Chang, 2019; Haryanti & Subriadi, 2020). Hence, this study contributes to the body of knowledge on e-commerce adoption among B2B SMEs in the context of emerging African countries.

Small and Medium-Sized Enterprises (SMEs) in Nigeria and South Africa

The concept of what an SME is varies from nation to nation. The size of an economy and its level of development are the main factors used to define SMEs (Mchunu, 2019). Because of this, there is no agreed-upon definition of an SME (Msomi et al., 2020; Raimi & Uzodinma, 2020). The framework for identifying what qualifies as an SME is by far the most frequently utilized, and it is based on the number of employees and annual sales turnover.

The National Small Business Act 102 of 1996 is the model for defining what constitutes an SME most frequently utilized in South Africa. According to the five criteria outlined in the Act, South Africa has five different types of small enterprises. These criteria are class size, the equivalent of paid employees, turnover, and asset worth, excluding fixed property. The definition of SMEs in the Act is based on personnel, revenue, and gross assets, just like the definition of foreign organizations. According to the Act, there are five different types of small-to-medium firms. Survivalist means that the money these companies make is not even close to the government poverty line. Vendors, hawkers, and subsistence farmers fall under the umbrella term "pre-entrepreneurial" in this category. The micro-enterprises sector is frequently considered to include survivalist businesses. Micro: These businesses have five or more employees, but a turnover below the ZAR 150,000 annual level is required for VAT registration. Typically, these businesses are not formally registered. Examples of enterprises on this list include domestic businesses, minibus taxis, and spaza shops. Extremely small: These are companies that employ no more than ten people. These businesses are engaged in the formal economy and have technological capability. Small: These companies employ no more than 50 people. They adhere to established business practices and are regarded as more established than the other businesses. Medium: These businesses employ between 100 and 200 people. The delegation of power often characterizes these enterprises to an additional management layer. The delegation of power frequently distinguishes these businesses to a second management layer. Gupta et al. (2018) examined the various definitions of SMEs, locally and internationally. They concluded that the number of employees in the firm and its turnover rate are the most used criteria to define commercial businesses. According to Gupta et al. (2018), the number of employees has been widely used because it is simple to implement and readily available.

Although there is no definition of SMEs, the literature suggests that with the lack of this definition, SMEs have been defined based on the size and structure of the industry within which they operate (Salifu et al., 2018). SMEs should be characterized according to their operational definition (Agboola & Festus, 2021). It has been widely acknowledged in Africa that, even though these companies are technically distinct, they face the same issues (Gupta et al., 2018).

In Nigeria, SMEs are defined based on prevailing government policies for specified periods and within distinct contexts. Regarding Nigerian businesses, Obafemi Awolowo University (OAU) Ife's Industrial Research Unit (IRU) defines small firms as firms with a total asset value of less than 250,000 Naira. (€1 144.65) (Olusegun, 2021).

The government used the criteria of the Small-Scale Credit Scheme (SSCS) to identify small businesses in which the capital investment in machinery and equipment must not exceed 150,000 Naira (€686,97) (Adedeji et al., 2020). In 1981/1982, the Nigerian Bank for Commerce and Industries

(NBCI) defined small firms as those that invested less than 500,000 Naira. Since 1985, the Bank's definition has been that a company's capital, excluding working capital but including land, should not exceed US$2,000 (Roberts, 2018).

A small firm requiring commercial bank loans is defined as one with a capital investment of not more than US$5 million, including working capital and a turnover of US$25 million per year, according to the Central Bank of Nigeria CBN's 1991 credit guideline-monetary policy circular No. 25. To qualify as an SME, the National Economic council determined that a project to be sponsored by the firm should cost ten million Naira (US $10,000) in total fixed assets. Central Bank of Nigeria (CBN) advocated that the definition of SME should include service industries employing less than 50 full-time workers if power plants and machinery are used. Thus, a very small firm could be described as a company with restricted capital, a small workforce, and a small geographic region. Its minimal assets and liabilities make it ineligible for a loan from financial institutions. Small businesses are critical to any country's economy, providing jobs and other advantages that giant corporations cannot match. However, for the aim of this research and due to their significant similarity, the South African definition has been adopted for this study.

E-COMMERCE ADOPTION AND SMES

E-commerce generally refers to organizational transactions that occur over the Internet involving firms, government entities, and other institutions (Alsaad et al., 2021). The term "business" encompasses both public and private enterprises. Successful e-commerce implementation offers significant opportunities for enhancing business activities such as trading relationships, information exchange, logistics coordination, and communication within global or regional supply chains (Bocconcelli et al., 2018). Notable e-commerce innovations include the Internet, Electronic Funds Transfer (EFT), email, Electronic Data Interchange (EDI), and barcodes, with a particular emphasis on their role in supporting B2B exchanges (Brink, 2017).

Given the potential benefits of e-commerce innovations for businesses, many scholars have focused on studying B2B e-commerce adoption in both advanced and developing countries. Table 1 summarizes previous research on e-commerce adoption among B2B SMEs in different countries. Although the studies listed in Table 1 are not exhaustive, they offer valuable insights into adopting e-commerce in developing nations. Two key observations can be made: a) most studies concentrate on e-commerce adoption across various business sectors, and b) the Technology-Organization-Environment (TOE) model and Diffusion of Innovation (DOI) theory are commonly used as the primary theoretical frameworks, with less attention given to constructs derived from other theoretical models.

Several researchers have also recognized the importance of examining e-commerce adoption from the perspective of South African and Nigerian SMEs. For example, Kikawa et al. (2019) studied 161 SMEs in South Africa, using the TOE theory to determine the significant factors influencing e-commerce adoption, including relative advantage, compatibility, and complexity. However, their study only assessed e-commerce adoption using a single perceptual element. In another study, Maduku (2021) integrated items from DOI and TOE models to examine innovation adoption in South African SMEs. The study found that relative advantage, compatibility, and complexity significantly influenced SMEs' e-commerce adoption. Mudzamba et al. (2022) explored e-commerce adoption among South African SMEs and identified relative advantage, compatibility, and complexity as influential factors. In the case of Nigerian SMEs, Oluyinka et al. (2013) examined the barriers hindering e-commerce adoption and identified poor infrastructure as a significant factor. Additionally, Awa (2014) used an integrated model incorporating items from TAM, TBR, and TOE to investigate innovation adoption in Nigerian SMEs, finding that perceived trust, company mission, and perceived service quality hindered the implementation of e-commerce adoption.

While these studies provide valuable insights, the current level of e-commerce innovation in the B2B SME sector in South Africa and Nigeria and the impact of technology, organization, and

Table 1. Empirical studies using the TOE framework

Illustrative Literature Sources	Country	Underlying Theories	Key Findings on Factors Affecting EC Adoption
Skafi et al. (2020)	Lebanon	TOE	Government initiatives and IT Infrastructure
Ocloo (2020)	Ghana	TOE	competitive pressure, organization's readiness, and perceived desirability
Hussein et al. (2020)	Jordan	TOE	Compatibility, information intensity Security and outsourcing IT support
Abed (2020)	Saudi Arabia	TOE	Trading partner pressure, top management support, and perceived usefulness
Yadav et al. (2019)	Indonesia	TOE	Human resources, strategy market forces e-readiness and awareness
Mohtaramzadeh et al. (2018)	Malaysia	TOE	Organization culture, top management, competitive pressure
Awa (2019)	Nigeria	TOE	Organization, technology, isomorphic
Haneem et al. (2019)	Malaysia	TOE	Top management, complexity, technology competency, and citizen demand
Cruz-Jesus et al. (2019)	Portugal	TOE	Competitive pressure, data quality, top management
Ocloo et al. (2018)	Ghana	TOE	Relative advantage and intensity of competition
Alsaad et al. (2017)	Jordan	TOE, DOI	Perceived desirability, trading partners
Hussein and Baharudin (2016)	Jordan	TOE	Relative advantage, organizational support, and competitive pressure
Walker et al. (2016)	Slovakian	TOE	Organisational readiness and Compatibility
Gangwar et al. (2015)	India	TOE	Relative advantage, complexity
Ramdaniet al. (2013)	England	TOE	Relative advantage, complexity compatibility, observability, and trialability

environment remain unclear. Moreover, these studies, like many e-commerce research conducted in other countries, primarily focus on e-commerce adoption trends from a TOE or DOI perspective.

Limited research has explored the TOE variables influencing e-commerce adoption in different countries. For example, Kosasi et al. (2019) proposed that technology, organization, environment, and individual factors determine the scope of adoption. Similarly, Ocloo et al. (2018) investigated how technology, organization, and environment are principal drivers of e-commerce adoption. Abed (2020) recently employed the TOE model to examine the impact of the external environment on SMEs' adoption of e-commerce. These scholars reported that during the initial stage of e-commerce adoption, the technology, organization, and environment levels significantly facilitated adoption.

Therefore, while previous research has shed light on the adoption of e-commerce among SMEs, further investigation is needed to understand the specific context of e-commerce adoption in emerging African economies such as South Africa and Nigeria. This study aims to address this gap by developing a comprehensive multi-perspective framework that integrates the TOE framework, DOI theory, and

institutional theory. By combining theoretical development with empirical analysis, we aim to provide a conceptual model and empirical evidence from South Africa and Nigeria, thus contributing to a deeper understanding of the drivers of e-commerce adoption among B2B SMEs in these countries.

THEORETICAL BACKGROUND, CONCEPTUAL FRAMEWORK, AND HYPOTHESES DEVELOPMENT

An analysis of the literature reveals that earlier studies on e-commerce adoption predominantly relied on a single or a combination of theories. Notably, the Technology-Organization-Environment (TOE) theory proposed by Tornatzky and Fleischer (1990), the Diffusion of Innovation (DOI) theory by Roger (2003), and Institutional Theory emerged as the most commonly applied frameworks (Tornatzky & Fleischer, 1990; Roger, 2003). These theories were the foundation for various models investigating different facets of e-commerce adoption.

While integrating these theories has significantly contributed to the understanding of technological, organizational, and environmental factors influencing innovation adoption among B2B firms, it is crucial to acknowledge the existence of several other critical factors that have been overlooked. Specifically, the influence of organizational culture within firms on their adoption of innovation has been primarily disregarded in prior studies utilizing the TOE framework (Abed, 2020; Hassen et al., 2021; Almunawar et al., 2022).

One promising avenue for e-commerce adoption lies in the opportunities it offers for firms to establish connections with other firms or customers over the Internet. A firm's interconnectedness in its operations can significantly shape its adoption of e-commerce (Tornatzky & Fleischer, 1990; Roger, 2003). Surprisingly, previous research on e-commerce adoption has neglected to explore the potential impact of the existing degree of interconnectedness among firms on their adoption of e-commerce. Within our study, we posit that the level of interconnectedness among firms represents a critical contextual variable that plays a pivotal role in their adoption of e-commerce. Additionally, our research highlights the potential enhancement of e-commerce adoption within highly formalized firms. The extent of formalization within a firm can influence its adoption of e-commerce, presenting a distinctive perspective from previous studies (Huang & Chang, 2019; Haryanti & Subriadi, 2020).

Furthermore, it is worth noting that prior studies on e-commerce adoption in small- and medium-sized enterprises (SMEs) have primarily focused on B2C SMEs (Maduku et al., 2016; Yin & Pan, 2020; Treiblmaier & Sillaber, 2021; Maduku, 2021), with limited attention given to factors influencing the adoption of e-commerce within this specific context (Annisa et al., 2018). By incorporating these additional organizational factors and addressing the research gaps present in previous studies, our research distinguishes itself by offering a unique perspective on adopting e-commerce.

Our study proposes a concise research model (Figure 1) that identifies critical factors influencing the adoption of e-commerce among B2B SMEs in Nigeria and South Africa. These factors include technological aspects (relative advantage, compatibility, and complexity), organizational elements (formalization, interconnectedness, and organizational culture), and environmental pressures (mimetic, coercive, and normative). We aim to understand the influences shaping e-commerce adoption in this context by considering these factors.

HYPOTHESES DEVELOPMENT

Technological Context

The relative advantage of e-commerce adoption is the anticipated benefits SMEs can glean from adopting and using the e-commerce platform. SMEs' owners are more likely to adopt e-commerce if they see its advantages over existing ones (Mokwena & Hlebela, 2018; Usman et al., 2019). Researchers who have studied the relationship between relative advantages and intention to use innovations and

Figure 1. The proposed conceptual framework for the study
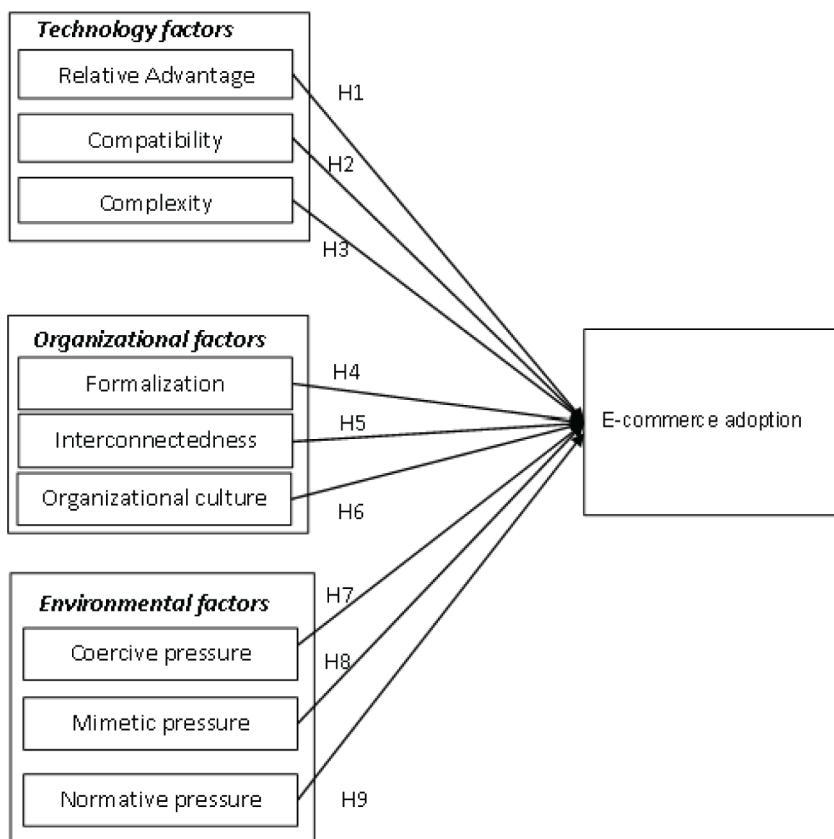
Source: Compiled by the author

suggest that relative advantage has a significant advantageous effect on the use of innovation (Buhari et al., 2022; Maduku, 2021; Usman et al., 2019). For these purposes, relative advantage is regarded as a significant variable in the adoption of e-commerce by B2B SMEs in South Africa and Nigeria. This relationship was hypothesized as follows:

H$_1$: Relative advantage significantly affects the adoption of e-commerce by B2B SMEs.

In this study, compatibility refers to how e-commerce integrates with existing firm processes, consumers, and vendors. According to Abner et al. (2019), the compatibility of e-commerce with company principles, customs, and preferred work practices is an essential indicator of adoption. Prior research on e-commerce adoption among SMEs discovered that e-commerce compatibility significantly affects its adoption and use (Abner et al., 2019; Maduku, 2021; Bello & Olanrewaju, 2022; Ayawei, 2022). As a result, a lack of firm compatibility may limit the amount of e-commerce used (Daoud and Ibrahim, 2019). This relationship was hypothesized as follows:

H$_2$: Compatibility significantly affects the adoption of e-commerce by B2B SMEs.

If a technology is perceived as complicated to use, it is less likely to be adopted (Ayong & Naidoo, 2019). For example, if e-commerce requires significant learning and effort, SMEs are less likely to embrace and use the e-commerce system. The degree to which adopters perceive innovation to be simple influences their behavioral intention to use it. The relationship between complexity and behavioral intention to use innovation has been established in studies on individual-level innovation adoption (Mbatha & Ngwenya, 2018; Sipahutar et al., 2020; Mullins & Cronan, 2021; Kateri, 2021; Ezennia & Marimuthu, 2022). This relationship was hypothesized as follows:

H$_3$: Complexity significantly affects the adoption of e-commerce by B2B SMEs.

Organizational Context

Formalization refers to firms relying on rules and processes to carry out their activities. According to Shaner et al. (2020), formalization refers to rules that define the responsibilities and roles of individuals, delegation of authority, interpersonal relationships and channels of information exchange, social norms, sanctions, and other operational elements. According to Nosike et al. (2021), firm dimensions such as formalization may influence businesses' innovative behavior. According to Etim and Daramola (2020), formalization facilitates the implementation of technological innovation. We therefore propose that:

H$_4$: Formalisation has a significant impact on the diversity of e-commerce use by B2B SMEs.

Interconnectedness reflects how different subunits within a system interrelate and interact. B2B SMEs consist of diverse units manned by distinct individuals. For these units to function efficiently and effectively, there must be provision of interface between these for the transmission of relevant market intelligence. This fosters the adoption of novel technologies in the business. Martinez-Jaramillo et al. (2019) pinpoint that interconnectedness facilitates interaction and exchange of information, as well as the actual use of information, which breeds e-commerce adoption by B2B SMEs. Rabiu et al. (2019) also reported similar findings in explaining the challenges and prospects of e-commerce among firms in Nigeria. It follows that factors such as rules, regulations, values, practices, and norms among SMEs should be fashioned in such a way that the overall culture of the organization would become one in which e-commerce adoption would thrive. Doing so would open up more doors for competitive advantage for the organization through the adoption and utilization of B2B SME e-commerce platforms.

H$_5$: Interconnectedness significantly affects the adoption of e-commerce by B2B SMEs.

Organizational culture, according to Affes and Affes (2021), is "the declared philosophy, ethos, values, presupposition, beliefs, hope, attitudes and conventions that bind the organization together. Ferreira et al., (2021, p. XXX) described it as an "informal design of values, norms that influence the way people and groups within the organisation interact with one another and with parties outside the organisation." Researchers have linked the concepts of organizational culture and the adoption of e-commerce. Several studies have shown that to implement and adopt new technologies effectively, an organization's culture must be a function of its strength (Trullen et al., 2020). This relationship was hypothesized as follows:

H$_6$: Organisational culture significantly affects the adoption of e-commerce by B2B SMEs.

Environmental Context

Coercive influence has been identified as a factor in technology adoption (Li and Wang, 2018, Chaubey and Sahoo, 2021, Leow, Phua and Teh, 2021). Prior studies indicate that such influence in Nigeria and South Africa remains significant in the innovation adoption (Kabanda et al., 2019; Abdullahi & Alias, 2022). Pu et al. (2021) found that because EDI is a dyadic innovation that connects firms, customers, and suppliers, it exerts coercive influence. Pressure from trade associations and government regulators is thought to be the primary source of coercive pressure in this study's innovation adoption. According to Alsaad and Taamneh (2019), coercive influence in businesses originates from either regulatory pressure by dominant firms or through existing business partnerships. This relationship was hypothesized as follows:

H$_7$: Coercive influence has significant effects on the adoption of e-commerce by SMEs.

Firms copy other firms' decisions in their efforts to implement into the system; therefore, we argue that firm owners or managers mediate the effect of mimetic influence on the B2B e-commerce adoption (Ikumoro & Jawad, 2019). For many business owners and managers, copying successful competition or peers is a way of avoiding embarrassment and maintaining the validity of their decisions during the adoption process. Managers or owners, for example, may be conflicted about how to redesign the business process in order to achieve firm innovation alignment and may take a gradual approach (Onwuchekwa et al., 2022) or a radical approach (Lopez-Arredondo et al., 2019; Weerakkody et al., 2021). Research evidence from Nigeria and South Africa has confirmed that mimetic influence is associated with the e-commerce adoption process (Kabanda et al., 2019; Abdullahi & Alias, 2022). The performance outcomes of the adoption are unreliable regardless of which approach is chosen. Thus, management teams tend to follow in the footsteps of other similarly structured firms that are regarded as successful (Leow et al., 2021). This relationship was hypothesized as follows:

H$_8$: Mimetic influence significantly affects the adoption of e-commerce by B2B SMEs.

The role of normative influence in the e-commerce process is closely related to the knowledge of critical features (Pradana et al., 2022). Once B2B e-commerce innovation is available for the firms' stakeholders' association with the industry, consultants, customers, suppliers, trading partners, and government, they jointly access the feature's innovation. It is advantageous to promote it for adoption, thereby influencing the norms of B2B e-commerce implementation and adoption. These normative influences significantly shape managers' or owners' emphasis on B2B e-commerce adoption in their respective firms (Leow et al., 2021). While these decisions are taken during the implementation and assimilation stages, they are equally crucial in the later stages of implementation and assimilation. Previous studies in Nigeria and South Africa (Kabanda et al., 2019; Abdullahi & Alias, 2022) found that normative influence is associated with e-commerce adoption. Ikumoro and Jawad (2019) reported that their findings showed that normative and managers' or owners' support is associated. This relationship was hypothesized as follows:

H$_9$: Normative influence significantly affects the adoption of e-commerce by B2B SMEs.

The Moderating Role of Context

According to the research, the structural perspective of an industry invariably determines the behavior and strategies of the element firms in the organization (Powell, 1996). Other research has demonstrated the importance of the industry in which component firms compete as a significant

predictor of individual firm-level performance (Etiennot et al. 2019). The current study is based on SMEs in the Business-to-Business sector. There are industry-specific differences between these two nations, which influence their method of e-commerce adoption. The overriding difference between firms in these sectors is market size; Nigeria has a larger market than South Africa in terms of GDP and population (Asiedu, 2006). Therefore, Nigerian B2B SMEs may have more potential customers to reach through e-commerce. However, South Africa has a growing middle class with increasing purchasing power, which presents an opportunity for SMEs to tap into (Saayman & Saayman, 2012).

In contrast, South Africa has a more developed telecommunications and logistics infrastructure than Nigeria (Enakrire & Ocholla, 2017). This difference means that South African B2B SMEs may have an easier time accessing the internet, managing online payments, and delivering goods to customers. Nigerian B2B SMEs may face more challenges in these areas, which could limit the potential advantages of e-commerce. In access to technology, by contrast, the availability and affordability of technology can vary between South Africa and Nigeria (Enakrire & Ocholla, 2017). South African SMEs may have better access to high-speed internet, smartphones, and other digital tools to facilitate e-commerce. Nigerian SMEs may face more challenges in accessing these technologies, which could limit their ability to take advantage of e-commerce opportunities. These differences are likely to influence e-commerce adoption in these countries. As a result, this study suggests:

H_{10}: The predictors of e-commerce adoption behavior differ for South African and Nigerian B2B sector SMEs.

METHODOLOGY

The following sections describe the methodology used to test the hypotheses, including measurement, pretesting, sampling and data collection, data analysis, and findings.

Measurements

All constructs were assessed using multi-scaled items. For a multivariate analysis such as structural equation modeling, all constructs in the conceptual model were scaled on a seven-point Likert-type scale with endpoints ranging from 'strongly agree' to 'strongly disagree' (Hair et al., 2021). The appendix contains information on the items used to measure the constructs.

The initial draft of the research method was pilot-tested with fifty respondents drawn from the study's target population. The researcher sent each participant a copy of the questionnaire and asked for feedback on the clarity of the instructions used in the research. According to the respondents, the survey form was easily understood and completed. The questionnaire was not changed as a result of the positive responses.

Sampling and Data Collection

This research's target population was B2B SMEs within the South African Nigeria B2B sector. The Yellow Pages business directory was used as the sample frame. First, a total of 800 B2B businesses were identified from the entire yellow Pages. The South African definition of SMEs (i.e., firms with fewer than 50 full-time workers and an annual turnover of less than 5 million rands, and "medium firms" with fewer than 200 full-time employees and an annual turnover of less than 20 million rands, while in Nigeria, the definition of SME should include service industries with fewer than 50 full-time workers and an annual turnover of 5 million Naira) were used to select 750 from the initial list of B2B firms. A random number generator was to select 740 for participation in the study.

The researcher made initial contact (through telephone and email conversations) with the owners/managers of the selected B2B SMEs to inform them about the study, their selection to participate in the study, and to ascertain their willingness to participate. This process further reduced the sample

to 700 since some were not ready to participate in the study. The link to the online survey was nested in a letter inviting the respondents to participate in the study.

Overall, 700 surveys were returned, yielding a 95% response rate. The questionnaire data were analyzed using SPSS software. Non-response is a potentially biased source in survey studies that must be addressed (Fowler, 1993). The potential bias is assessed by comparing feedback from early and late participants. E-commerce researchers such as Liang et al. (2017) and Chattaerjee et al. (2017) also use this method. Early participants completed the questionnaire within the first six weeks, while late respondents completed it after the deadline. Approximately 70% of the answers were from early respondents.

DATA ANALYSIS AND RESULTS

The PLS-SEM approach was the primary data analysis tool used in this study. PLS-SEM is a popular method in information systems research. Nordhoff et al. (2021) used the PLS method to SEM to underpin prediction-oriented studies. Hence, its use in this study to identify the drivers of e-commerce adoption among B2B SMEs was appropriate. The model estimates were generated using the SmartPLS 3.2 software.

SEM Analysis

Three steps were involved in SEM analysis. First, Cronbach's alpha was used to assess the dependability of each construct in the model. The validity of the constructs was established in the second step using factor analysis. Finally, a logistic regression technique was used in the third step to assess the impact of nine individual variables on adopting each e-commerce innovation included in this study.

Measurement Model Analysis

This study used confirmatory factor analysis (CFA) to assess convergent and discriminant validity. The constructs' reliability was determined by observing the standardization factor loadings of each construct. An acceptable threshold for item reliability is a factor loading greater than 0.6. (Kamboj & Rana, 2021). According to the results in Table 2, all of the factor loadings are greater than 0.5, indicating their dependability.

A confirmatory factor analysis (CFA) was performed using SmartPLS to evaluate the psychometric properties of the measurement model. The CFA was carried out in two steps. These included the evaluation of measurement models and structural model analyses. The convergent validity of the measure was first assessed when analyzing the measurement model, and the results are shown in Table 3. This was followed by a discriminant validity assessment of the Fornell and Larcker (1981) criterion, the results of which are shown in Table 4, and the HTMT criteria, which are shown in Table 5 (Henseler et al., 2018). Following validation of the validity of the measurement model, the structural model was investigated to test the study's hypotheses. The structural model analyses also included multiple group analyses to see if the relationships stated in the structural model were statistically different among B2B SMEs in Nigeria and South Africa.

Structural Model Analysis

After confirming the validity of the measures of the constructs employed in the study, the proposed model was examined to test the hypotheses proposed for the study. Prior to the structural model analysis, a collinearity assessment was performed using the variance inflation factors (VIF) as indicated by (Hair et al., 2021).

VIF metrics were examined to see if there were any issues with multi-collinearity. In Table 5, the VIF values for the constructs were less than 3, as they ranged from 1 to 2.448, indicating no issues with multi-collinearity among the components.

Table 2. Statistical evidence of convergent validity

Constructs	Item	Factor Loadings	Composite Reliability	AVE
Complexity	CMX1	0.891	0.871	0.693
	CMX2	0.804		
	CMX3	0.799		
Compatibility	COM1	0.964	0.853	0.747
	COM2	0.752		
Coercive influence	CRI1	0.917	0.922	0.855
	CRI2	0.932		
Formalization	FMT1	0.865	0.892	0.735
	FMT2	0.873		
	FMT3	0.833		
Interconnectedness	INT1	0.824	0.854	0.661
	INT2	0.816		
	INT3	0.799		
Mimetic influence	MMI1	0.899	0.830	0.622
	MMI2	0.790		
	MMI3	0.661		
Normative	NMI1	0.914	0.926	0.759
	NMI2	0.848		
	NMI3	0.828		
	NMI4	0.893		
	OBT3	0.232		
Organizational culture	OGC1	0.998	0.713	0.491
	OGC2	0.380		
	OGC3	0.600		
Relative Advantage	RAD1	0.922	0.810	0.592
	RAD2	0.710		
	RAD3	0.651		
	RAD4	0.751		

To test the hypotheses, we used path coefficients, the coefficient of determination (R^2) for the endogenous construct, effect size (f^2), and predictive relevance (Q^2). The structural model analysis results, including hypothesis testing, are presented for the sample comprising B2B SMEs from Nigeria and South Africa. In addition, separate analyses are conducted for the Nigerian and South African samples, allowing for comparisons to be drawn regarding the similarities and differences in the factors influencing e-commerce adoption among B2B SMEs in these specific contexts.

The effect sizes are also presented in table 6 because they assess the model's predictive significance and may be evaluated using Cohen's (1988) f^2 formula (Henseler, 2018). The f^2 calculates

Table 3. Results of the discriminant validity of the measurement model using the Fornell and Larcker technique

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Coecive influence	0.056	0.925												
2	Comatibility	0.589	-0.149	0.864											
3	Comlexity	-0.262	0.369	-0.274	0.832										
4	Formalization	0.081	-0.426	0.201	-0.134	0.857									
5	Interconnectedness	0.181	-0.351	0.340	0.134	0.417	0.167	-0.064	0.813						
6	Mimtic influence	0.532	-0.013	0.603	-0.140	0.176	0.571	0.246	0.355	0.789					
7	Norative	0.605	-0.093	0.624	-0.370	0.208	0.557	0.271	0.189	0.574	0.871				
9	Orgnizational culture	0.543	0.015	0.501	-0.357	0.097	0.544	0.289	0.062	0.514	0.552	-0.143	0.701		
10	Reltive Advantage	0.533	-0.175	0.567	-0.291	0.153	0.539	0.166	0.290	0.575	0.599	-0.089	0.497	0.770	

* Diagonal values are the square root of AVEs

Table 4. HTMT assessment for discriminant validity

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Coercive influence	0.257													
2	Compatibility	0.771	0.183												
3	Complexity	0.375	0.354	0.313											
4	Formalization	0.163	0.516	0.213	0.191										
5	Interconnectedness	0.286	0.448	0.462	0.284	0.534	0.257	0.274							
6	Mimetic influence	0.677	0.115	0.804	0.177	0.209	0.735	0.300	0.502						
7	Normative influence	0.699	0.189	0.723	0.410	0.190	0.621	0.359	0.242	0.656					
9	Organizational culture	0.634	0.318	0.540	0.387	0.161	0.664	0.459	0.190	0.577	0.529	0.437			
10	Relative Advantage	0.664	0.208	0.745	0.336	0.174	0.666	0.255	0.392	0.799	0.672	0.268	0.528		

the contribution of the independent (exogenous) variables to the R^2 of the model's endogenous components (Benitez et al., 2020:11). According to Cohen (1988:25), the f^2 estimate that includes small ranges, from 0.02 and 0.15, the medium range is from 0.15 and 0.35, while large is above 0.35. The results of the Predictive relevance (Q^2) are shown in Table 7; as indicated in Table 7, the Q^2 for endogenous variables exceeded zero (0.238) concerning e-commerce adoption. Therefore, the predictive relevance of the model was confirmed.

The results of the structural model analyses and the tested hypotheses are presented in Table 8.

The results of the data for both countries show that relative advantage (β=0.135, t=4.193, p<0.001), formalization (β=0.167, t=5.513, p<0.001), organizational culture (β=0.068 t=2.046, p<0.001), interconnectedness (β=0.180, t=5.609, p<0.001) and normative pressure (β=0.191, t=5.507, p<0.001) had a significant and positive impact on the participating B2B SMEs' adoption of e-commerce. This provides statistical support for H1, H4, H5, H6, H5 and H6.

Moreover, the results also suggest that complexity (β=-0.155, t=5.192, p<0.001) and coercive influence (β=-0.370, t=12.040, p<0.001) had a significant and negative impact on the adoption of e-commerce among the B2B SMEs. Thus, H3 was supported, while H7 was not supported. Compatibility (β=0.005, t=0.142, p<0.001) and mimetic influence (β=0.017, t=0.509, p<0.001) had no significant relationship to adopt B2B e-commerce and are thus not supported.

Table 5. Inner VIF values

	Absorptive Capacity	Diversity of Use	Ecommerce Adoption	Formalization	IT Activity	Volume of Use
Absorptive capacity			2.448		1.3	
Coercive influence			2.28			
Compatibility			2.323			
Complexity			1.771			
E-commerce Adoption		1				1
Formalization			1.437			
IT activity			2.03			
IT infrastructure	1		2088		1.3	
Interconnectedness			1.81			
Mimetic influence			2.269			
Normative			2.437			
Observability			1.508			
Organizational culture			2.023			
Relative Advantage			2.118			
Trialability			2.271			

Table 6. Effect Size (f²)

	Diversity of Use	Volume of Use
Coercive Influence	0.027	0.343
Compatibility	0.005	0.015
Complexity	0.040	0.145
Formalization	0.004	1.193
Interconnectedness	0.029	0.037
Mimetic influence	0.000	0.012
Normative influence	0.075	0.056
Organizational Culture	0.017	0.014
Relative Advantage	0.012	0.031

DISCUSSIONS AND IMPLICATIONS

This study aimed to identify the factors that influence e-commerce adoption among South African and Nigerian B2B SMEs. To achieve this goal, a multi-perspective framework that considered technological, organizational, and environmental factors was used to propose a theoretical model of e-commerce adoption behavior. The hypothesized model was validated using an online survey of randomly selected B2B SME owners or managers. The implications of these findings are discussed in the following section.

Technological Context

Of the three innovational drivers examined in this research, relative advantage and complexity were significant drivers of e-commerce adoption in the overall sample and the B2B SME sector sample. This

Table 7. Predictive relevance (Q²)

	SSO	SSE	Q² (=1-SSE/SSO)
Relative Adv	3798	3798	
Compatibility	2532	2532	
Complexity	3798	3798	
Formalization	3798	3798	
Interconnectedness	3798	3798	
Organizational culture	2532	2532	
Coercive influence	2532	2532	
Normative	5064	5064	
Mimetic influence	3798	3798	
E-commerce Adoption	13926	10617.85	0.238

Source: Author's own compilation

Table 8. Summary of hypothesis testing

	Hypothesized Relationship	Path Coef.	T-Statistics	P Value	Decision	f²
H1a	Relative Adv -> E-commerce Adoption	0.135	4.193	0.000	Supported	0.031
H1b	Compatibility -> E-commerce Adoption	0.005	0.142	0.887	Not supported	0.000
H1c	Complexity -> E-commerce Adoption	-0.155	5.192	0.000	Supported	0.049
H2a	Formalization -> E-commerce Adoption	0.167	5.513	0.000	Supported	0.071
H2b	Organizational culture -> E-commerce Adoption	0.068	2.046	0.041	Supported	0.008
H2c	Interconnectedness -> E-commerce Adoption	0.180	5.609	0.000	Supported	0.065
H3a	Coercive influence -> E-commerce Adoption	-0.370	12.040	0.000	Not supported	0.218
H3b	Mimetic influence -> E-commerce Adoption	0.017	0.509	0.611	Not supported	0.000
H3c	Normative -> E-commerce Adoption	0.191	5.507	0.000	Supported	0.054
Q²	0.186					

Source: Author's own compilation

finding is consistent with Mapande and Appiah (2018) and Otika et al. (2022) in Nigeria and South Africa, where they found relative advantage and complexity- but not compatibility to be statistically positively linked with innovation adoption. While compatibility strongly predicts e-commerce adoption in prior studies, its influence in the overall and business-to-business sector samples is insignificant.

Relative advantage and complexity are the efficiency dimensions of an innovation. Ayokunmi et al. (2022) argue that business-to-business SMEs tend to be interested in solutions that improve operational efficiency. This may explain why the relative advantage and the complexity of the e-commerce innovation are essential predictors of its adoption among the business-to-business SME sector. Prior studies in the tourism sector indicate that compatibility, rather than relative advantage or complexity, is a crucial element of e-commerce adoption in the tourism industry. Although these

findings are inconsistent with propositions in the DOI theory, they validate the findings of prior studies. In a study of the determinants of adopting CRM implementation by healthcare, Jalal et al. (2021), found that complexity is not significantly related to adoption. Surprising results of the non-significant relationship between relative advantage and the adoption of e-commerce reservation systems by hotels are noted in the prior studies (Tian & Wang, 2017; Ezzaouia & Bulchand-Gidumal, 2020). This result shows that compatibility is not an essential and significant determinant of e-commerce adoption by SME owners or managers. Though this result negates the findings of earlier researchers, such as where Maduku (2021) and Igwe et al. (2021) showed compatibility as an essential determinant of ecommerce adoption, the current results indicate the perceptions of compatibility among the participants. Otika et al. (2022) also reported a higher rate of adoption of e-commerce if it is with a firm's existing work practices and values, yet the results of this study contrast these submissions. This contrast may be because the participants believe compatibility with company practices, values, and norms is not an issue as long as the innovation has covert observable relative advantages that will keep them ahead of key competitors. Thus, company values, practices, or norms can be adjusted to be innovation compatible, provided its adoption guarantees viable competitive advantages. Adaptability is, therefore, what is seen to be at play among the participants of this study. Given this result, B2B SMEs are encouraged to be adaptive and fashion their internal values so that compatibility between e-commerce innovation and possible adoption could thrive.

Organizational Context

The results indicated a significant and positive association between formalization and e-commerce adoption by B2B SMEs, corroborating prior studies' findings (Al-Somali et al., 2015; Alhassan, 2018; Igudia, 2018; Fatoki, 2020). The implication of the results of this study and others show that organizational rules and regulations, which are known as formalisation in this study, sway e-commerce adoption among B2B SMEs to a significant extent.

Similarly, this research found interconnectedness significantly related to e-commerce adoption by B2B SMEs. This result is consistent with the findings of (Rabiu et al., 2019, Martinez-Jaramillo et al., 2019; Pateli et al., 2020; Eze et al., 2021) that interconnectedness enables communication and data exchange, as well as the use of actual information, which encourages B2B SMEs to adopt e-commerce. It follows that factors such as rules, regulations, values, practices, and norms among SMEs should be fashioned in such a way that the overall culture of the organization would become one in which e-commerce adoption would thrive. Doing so would open up more doors for competitive advantage for organizations by adopting and utilizing B2B SME e-commerce platforms.

This study found that organizational culture is significantly related to e-commerce adoption by B2B SMEs, corroborating findings from Ibrahim et al. (2019), Affes and Affes (2021) and Govinnage and Sachitra (2021). This finding is because organizational culture provides the boundaries in which organizational activities are performed. E-commerce is a critical organizational activity that functions as the prevalent organizational rules, practices, and values determined by its culture. The study's findings on the association between organizational culture and e-commerce adoption by B2B SMEs are unsurprising. They further stated that organizations that fail to adopt prevailing technologies due to rigid organizational cultures lose competitive grounds to competing firms that take advantage of technological innovations.

Environment Context

Coercive influence has been identified to be a significant driver in the adoption of innovations. Previous research predicts that such influence remains significant in the innovation adoption process (Abraham, 2018; Ayong & Naidoo, 2019; Alsaad et al., 2021). Increased coercive influences reduce the chances of e-commerce adoption by B2B SMEs; this is true to an extent because where the pressure to adopt e-commerce innovation as presented by the customers or industry regulations, coping with such pressures amid other business necessities may become overwhelming, reducing the likelihood

of e-commerce adoption. Pressure from other enterprises on which a focal firm is dependent and to conform to societal expectations influences a firm's e-commerce adoption. The finding also impacts B2B SMEs' adoption of e-commerce and, thus, the reported result.

However, this test's result revealed no important association among mimetic influence and e-commerce adoption by B2B SMEs. These findings negate the findings of prior scholars (Abraham, 2018; Alsaad et al., 2019; Alsaad & Taamneh, 2019; Ayong & Naidoo, 2019). This is true as firm owners or managers mediate the effect of mimetic influence on the B2B e-commerce adoption process when it replicates the choices made by other firms in their attempts to integrate the system. Where owners or managers are un comfortable with what they see from their peers, the decision to adopt such innovations is significantly reduced. As an example, in their effort to achieve firm innovation alignment, managers or owners may face ambivalence about how they undertake the redesign of a business process; they may follow a gradual approach.

The role of normative influence in the B2B e-commerce adoption process is a significant driver of e-commerce adoption in the overall sample, thus validating those of previous studies (Liang et al. 2017; Chattaerjee et al., 2017; Kabanda et al., 2019; Abdullahi & Alias, 2022; Leow et al., 2021; Pradana et al., 2022). Once B2B e-commerce innovation is available to the firm (stakeholder's industry association, consultants, customers, suppliers, trading partners, and government) to access the features' innovation jointly, it is advantageous to promote it for adoption. The process involves shaping firms' norms regarding the implementation and consequent adoption of B2B e-commerce. These normative influences play a significant role in shaping managers' or owners' emphasis on B2B e-commerce adoption in their respective firms. At both the implementation and assimilation stages, these decisions are t considered, with the latter being more critical.

STUDY CONTRIBUTIONS

The theoretical and practical contributions of the research are provided in this section.

Theoretical Contributions

This study significantly contributes to understanding factors influencing innovation adoption among B2B firms by recognizing the critical role of organizational culture as an organizational element that influences adoption decisions. By incorporating organizational culture within the Technology-Organization-Environment (TOE) framework, this research fills a gap in prior studies that have overlooked its potential impact on innovation adoption. It expands the theoretical framework and provides a more comprehensive perspective on the factors influencing adoption.

Furthermore, the study introduces the level of interconnectedness among firms as a context-specific variable that plays a pivotal role in e-commerce adoption. Previous research has neglected to explore the potential impact of existing interconnectedness on e-commerce adoption, making this study's examination of firm connectivity unique and valuable. The findings offer new insights into the relationship between interconnectedness and e-commerce adoption.

In addition, this research highlights the influence of formalization within firms on their adoption of e-commerce. By considering the extent of formalization as a determinant of adoption, the study provides a distinct perspective on the organizational factors influencing e-commerce adoption. This novel approach contributes to the existing literature on e-commerce adoption by shedding light on the role of formalization within the B2B context.

Unlike previous studies that primarily focused on e-commerce adoption in B2C SMEs, this research addresses a research gap by explicitly investigating the factors influencing e-commerce adoption in B2B SMEs. By incorporating additional organizational factors and contextualizing the study within the B2B SME context, this research provides a more comprehensive understanding of e-commerce adoption and its unique challenges and opportunities in this specific context.

The study proposed and tested a concise research model that identifies critical factors to analyze e-commerce adoption in B2B SMEs. These factors include technological aspects (relative advantage, compatibility, and complexity), organizational elements (formalization, interconnectedness, and organizational culture), and environmental pressures (mimetic, coercive, and normative). By integrating these factors, the research model offers a comprehensive framework for analyzing e-commerce adoption in the B2B SME context and contributes to advancing theoretical knowledge in the field.

Moreover, this study goes beyond the existing literature by conducting a comparative analysis of factors influencing e-commerce adoption across different cultural and economic contexts. By focusing on B2B SMEs in Nigeria and South Africa, the research provides valuable insights into the contextual factors that shape e-commerce adoption in these countries. This comparative approach enhances our understanding of the unique challenges and opportunities faced by B2B SMEs in different contexts and enriches the existing literature on e-commerce adoption.

LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This research's findings were derived from data obtained from B2B SMEs in South Africa and Nigeria. These countries were selected because they represent the economic hub of Africa and how the SMEs sector makes a substantial contribution to national economic development. The primary objective of the study was encompass B2B SMEs across the entire continent. To achieve this, certain limitations were imposed, including the selection of only two countries for analysis. However, these limitations were carefully managed to ensure that the study outcomes remain unaffected. The inclusion of participants from various sectors within both countries enhanced the generalizability of the study findings.

Secondly, the data collected was cross-sectional rather than longitudinal. The conceptual model's relationships were only inferred rather than proven. Longitudinal data should be collected to examine causal links more clearly.

Lastly, the study sample was drawn from B2B SME owners/managers in Nigeria and South Africa. Due to cultural differences that may affect the validity of the results across country borders, it is suggested that the research model be tested further in other developing countries to determine its validity in acknowledging the adoption of e-commerce and other comparable innovations.

CONCLUSION

The contribution of SMEs to economic progress is constrained by their limited e-commerce skills and capacities, despite being widely recognized as a catalyst for economic growth in many nations, especially in developing countries. Further complicating matters is that they do not have enough money for modern business techniques, which can be costly. The advent of e-commerce innovations for business operations has opened up new and varying opportunities for firms. B2B SMEs will to use these opportunities seeking new means to overcome mundane and traditional marketing challenges.

Adopting e-commerce e-innovations is an effective tool for achieving business success, especially for B2B SMEs. The findings of this research confirmed this, as it reveals not only the various TOE drivers that determine e-commerce adoption among the studied B2B SMEs.

These TOE and DOI elements that influence the adoptive capacity and decisions of B2B SMEs are, therefore, critical in supporting the adoption of e-commerce. The data gathered from 700 B2B SMEs show that e-commerce adoption is influenced by a company's behavioral desire to use e-commerce. To encourage the expansion of B2B SMEs, governments, non-governmental organizations, and financial institutions should begin by looking at the elements that promote e-commerce.

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APPENDIX

Table 9. Summary of hypotheses testing for the nigerian sample

	Hypothesised Relationships	Coefficients	T Statistics	P Values	Decision	f²
H1a	Relative Adv -> Ecommerce Adoption	0.077	1.049	0.294	Not supported	0.006
H1b	Compatibility -> Ecommerce Adoption	0.111	1.466	0.143	Not supported	0.011
H1c	Complexity -> Ecommerce Adoption	-0.088	0.856	0.392	Not supported	0.006
H1d	Observability -> Ecommerce Adoption	-0.098	0.919	0.358	Not supported	0.012
H1e	Trialability -> Ecommerce Adoption	0.059	0.748	0.455	Not supported	0.003
H2a	Formalisation -> Ecommerce Adoption	0.033	0.197	0.844	Not supported	0.002
H2b	Interconnectedness -> Ecommerce Adoption	-0.114	0.900	0.368	Not supported	0.009
H2c	Organisational culture -> Ecommerce Adoption	0.108	1.453	0.147	Not supported	0.012
H3a	Coercive influence -> Ecommerce Adoption	-0.053	0.394	0.694	Not supported	0.003
H3b	Mimetic influence -> Ecommerce Adoption	0.095	1.144	0.253	Not supported	0.008
H3c	Normative -> Ecommerce Adoption	0.256	2.322	0.020	supported	0.057

Table 10. Summary of hypotheses testing for the South African sample

	Hypothesised Relationships	Path Coefficient	T Statistics	P Values	Decision	f²
H1a	Relative Adv -> Ecommerce Adoption	0.160	3.025	0.003	Supported	0.033
H1b	Compatibility -> Ecommerce Adoption	-0.011	0.217	0.828	Not supported	0.001
H1c	Complexity -> Ecommerce Adoption	-0.197	4.902	0.000	Supported	0.056
H1d	Observability -> Ecommerce Adoption	0.133	2.744	0.006	Supported	0.060
H1e	Trialability -> Ecommerce Adoption	0.079	1.998	0.046	Supported	0.006
H2a	Formalisation -> Ecommerce Adoption	0.065	1.403	0.161	Not supported	0.071
H2b	Interconnectedness -> Ecommerce Adoption	0.117	2.960	0.003	Supported	0.061
H2c	Organisational culture -> Ecommerce Adoption	0.092	2.333	0.020	Supported	0.021
H3a	Coercive influence -> Ecommerce Adoption	-0.330	7.887	0.000	Partially Supported	0.214
H3b	Mimetic influence -> Ecommerce Adoption	-0.032	0.761	0.447	Not supported	0.000
H3c	Normative -> Ecommerce Adoption	0.155	3.229	0.001	Supported	0.049

Table 11. The constructs and survey items

Construct	Adapted Items	Adapted Sources
Relative advantage	RAD1: Using e-commerce to buy and sell, rather than our current method of buying and selling, would make our firm more effective. RAD2: Using e-commerce to buy and sell, rather than our current method of buying and selling, would increase our firm's productivity. RAD3: Using e-commerce to buy and sell, rather than our current method of buying and selling, would improve our firm's performance RAD4: Using the current method of buying and selling, would enable us to obtain timely and accurate information for decision-making.	Polites and Karahanna, (2012)
Compatibility	COM1: E-commerce adoption is compatible with our buying and selling strategies. COM2: The e-commerce adoption fits into our firm's culture and value system. COM3: E-commerce adoption would be compatible with the current business ideas of our firm. COM4: E-commerce adoption would be compatible with our preferred way of doing business within our firm.	Zhu et al. (2006)
Complexity	CMX1: E-commerce adoption requires a lot of mental effort. CMX2: The adoption of e-commerce is sometimes frustrating. CMX3: E-commerce adoption would be complex for our firm. CMX4: The skills needed to adopt e-commerce would be too complex for our firm.	Oliveira at el. (2014)
Formalisation	FMT1: An employee can make his or her own decision without checking with anybody else. FMT2: How things are done around here is left to the person doing the work. FMT3: People here are allowed to do almost as they please. FMT4: Most people here make their rules on the job. FMT5: The employees are constantly being checked for rule violation. FMT6: People here feel as though they are constantly being watched to see that they obey all the rules.	Jaworsk and Kohli (1993)
Interconnectedness	INT1: In our firm, it is easy to talk with virtually anyone, regardless of rank or position. INT2: There is ample opportunity for informal talk among individuals from different departments in our firm. INT:3 In our firm, employees from different departments feel comfortable calling each other when the need arises. INT4: Managers here discourage employees from discussing work-related matters with those who are not their immediate superiors or subordinates. INT5: People around here are quite accessible to those in other departments. INT6: Communications from one department to another are expected to be routed through proper channels. INT7: Junior managers in my department can easily schedule meetings with junior managers in other departments.	Jaworsk and Kohli (1993)
Organisational culture	OGC1: Our firm emphasises growth through acquiring new resources. Acquiring new products/services to meet new challenges is important. OGC2: Our firm emphasises competitive actions, outcomes and achievement. Accomplishing measurable goals is important. OGC3: Our firm emphasises tasks and goal accomplishment. A production and achievement orientation are commonly shared.	Wang and Noe (2010)
Coercive Influence	CRI1: The local government requires our firm to adopt e-commerce. CRI2: The industry association requires our firm to adopt e-commerce. CRI3: The competitors' conditions require our firm to adopt e-commerce. CRI4: Our suppliers require our firm to adopt e-commerce. CRI5: Our important customers expect us to adopt e-commerce.	Liang et al. (2007)
Mimetic	MMI1: Our firm's main competitors that have adopted e-commerce have benefited significantly. MM2:Our firm's main competitors that have adopted e-commerce are seen favorably by customers. MM3: Our firm's main competitors that have adopted e-commerce are more competitive. MM4: Our firm's main competitors that have adopted e-commerce are seen favourably by their customers and suppliers.	Liang et al. (2007)
Normative	NMI1: The extent of e-commerce adoption by your firm's suppliers. NMI2: The extent of e-commerce adoption by your firm's customers. NMI3: The extent of e-commerce to which the government promotion of IT influences your firm's e-commerce adoption. NMI4: The extent of adoption by trading partners and competitors.	Liang et al. (2007)

Source: Author's own compilation