

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

KNUST

Effect of Technological Dynamism on Procurement Performance; the mediating role of E-Business Proactiveness

by

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DECLARATION

I hereby declare that this submission is my own work towards the Master of Science, Logistics and Supply Chain Management and that to the best of my knowledge, it contains no material previously published by another person nor material that has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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DEDICATION

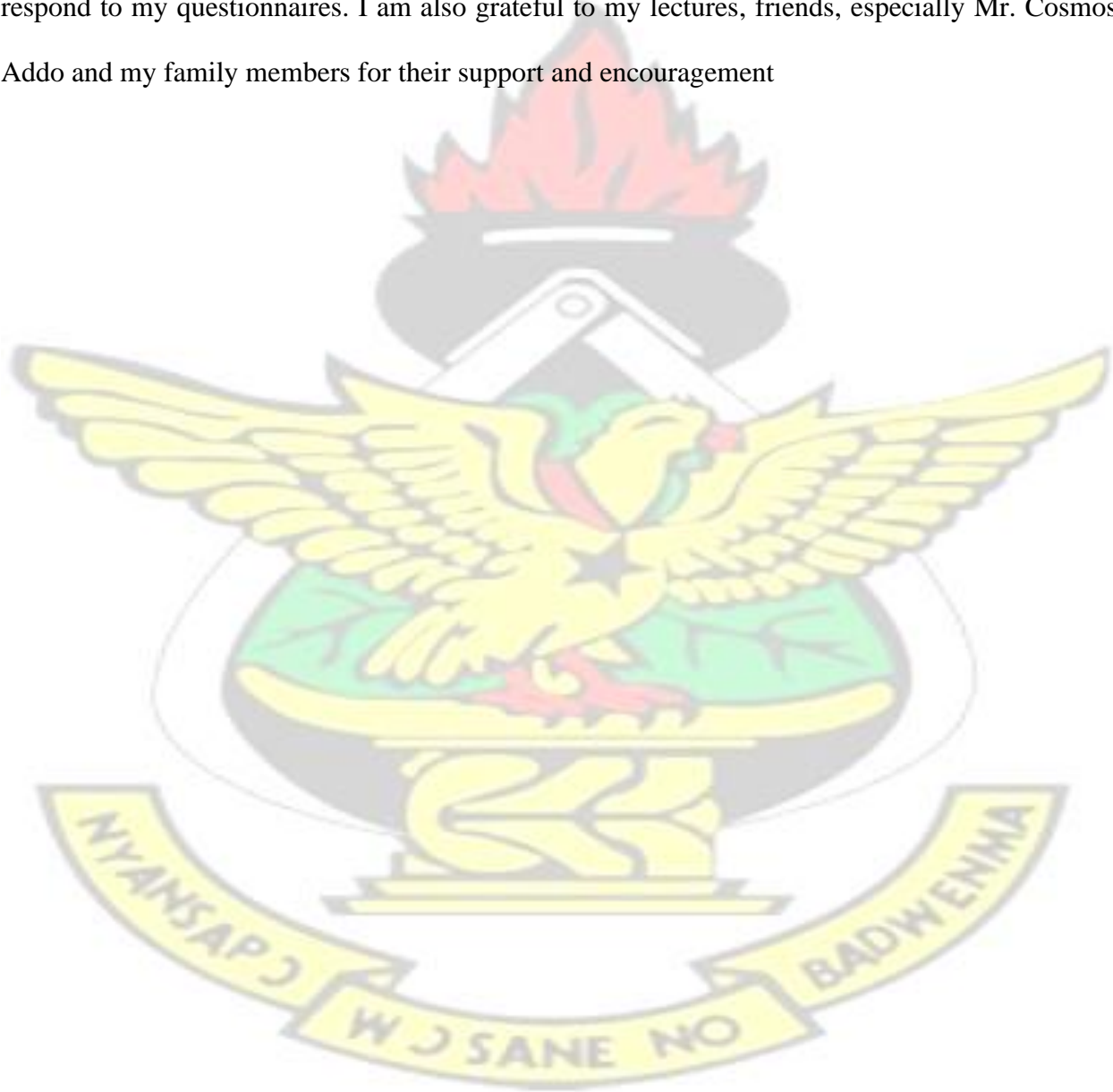
This work is dedicated to my family and Dr. Esther Ofer-Aboagye for their encouragements and supports,

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ABSTRACT

The study was conducted to analyze how technological dynamism affects public sector procurement performance in Ghana by way of e-business proactiveness as a mediator variable. Three separate goals were offered as a response to the issues outlined in the problem statement. The study used deductive reasoning for the quantitative data and a cross-sectional descriptive survey approach. The sample procedures, the development of research equipment, and the analysis were all informed by a quantitative approach to the study. The hypotheses in this research were grounded on the preexisting RBV and PAT. Procurement officers, retail managers, warehouse managers, and members of entity tender committees made up the study's population of senior managers. A total of 286 staff members with extensive experience with the phenomenon under investigation participated in the survey. Managers from Ghana's public sector firms were selected using a purposive sample strategy for this research. Structural Equation Modeling (SmartPLS 4) was used to verify the study's assumptions. In the research, descriptive statistics were used to summarize the collected data. The results showed that technological dynamism has a significant effect on the performance of public sector procurement. Proactivity in e-business was also shown to have a significant impact on procurement performance, acting as a mediator between technological dynamism and procurement performance. According to the findings, public sector managers may boost procurement performance by fostering technology dynamism and e-business proactiveness. The leadership of public sector enterprises must create a long-term technology strategy, choose their preferred technology-related media channels, and invest in the internet of things, information technology, and other related technologies.

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CHAPTER ONE

INTRODUCTION

Background to the Study

The role government procurement constitutes as stimuli for development has been an issue of particular interest over the past decade (Odero and Ayub, 2017; Liu et al., 2019; Patrucco et al., 2019; Raj et al., 2020). Public procurement provides varied contributions among countries, regions as well as sectors to underlying operations in health, environment, ICT, defense or infrastructure, etc (Lember et al., 2014; Edquist, 2015; 2016; Maria et al., 2019). Procurement, therefore, plays an integral role in any establishment whether public or private. According to OECD (2017), procurement constitutes approximately 15% - 20% GDP of developed economies. Governments in both developed and developing economies attach significant attention to the issue of procurement. Owing to this, various governments across the globe have attempted to reform and implement sound procurement policies and practices inane effort to enhance value for many when procuring goods and services required to meet public needs (Osei-Tutu et al., 2010; Hazarika and Jena, 2017; Kinuthia et al., 2019). Unfortunately, public procurement outcomes or performance remain challenged despite various procurement reforms in developing economies, especially Sub Sahara Africa which Ghana is no exception (Schapper et al., 2006; Basheka and Bisangabasaija, 2010; Uyarra et al., 2014; Hazarika and Jena, 2017).

Efficiency and effectiveness remain two important measures of procurement performance. According to Anane and Kwarteng (2019), effective procurement occurs when previously defined goals and objectives regarding the acquisition of goods and services in any organization are met.

This term connects actual and planned performance, which is used to make a decision. Following that, effective procurement connects planned and real obtained resources to achieve established goals and objectives. Achieving efficiency in public procurement is not just an issue of the buying entity but a joint effort of the supplier and buyer. This demonstrates that both the buyer and supplier are two important entities in ensuring efficiency in public procurement. Technology has been cited as among the important factors that enhance procurement performance. Thus, the advent of information technology (IT) has made the way of improving effectiveness and efficiency of business operations including procurement (Odkhishig et al., 2020), while further development of IT, in the forms of radio-frequency identification (Angeles, 2009), the internet of things (Tu, 2018), big data analytics (Brinch, 2018), cloud and blockchain technologies (Treiblmaier, 2018), to name just a few, have played a vital role in facilitating procurement processes. Technological dynamism refers to the rate of change in and the unpredictability of new technologies (Wu et al., 2005; Xiaohua et al., 2019). Over the last decades, the importance and influence of technology dynamism as part of organizational business strategies have been increasingly stressed in light of emerging global value chains, which are profoundly affecting manufacturing, international trade, and other facets of global business including procurement (Reyes Gereffi and Lee, 2016; Fabra and Montero, 2020; Pananond et al., 2020; Modgil et al., 2021; Yevu et al., 2022; Nguyen et al., 2020). The reality of technology application in the supply chain, specifically procurement can be observed through doing online auctions, an application of online catalogues which facilitate purchasing documents exchange between parts (Baddeley & Kopelman, 2015; Sánchez-Rodríguez et al, 2020; Tutu et al, 2019). Furthermore, opting for online requisition, follow-ups, and order management

has led to higher procurement efficiency and cost reduction even for organizations faced with higher regulatory pressure (Wiengarten et al, 2015). Technology dynamism (Chan, Yee, Dai, & Limm, 2016; Cruz-González, López-Sáez, Navas-López, & Delgado-Verde, 2015, Kwon, Lee, & Jung, 2016) of the relevant industries are becoming important factors for firms to conduct their business and attain business performances such as revenue increase and enhanced procurement performance.

Technology dynamism, therefore, remains essential way of achieving enhanced procurement management. Prior studies (Zunk et al., 2020; Woschank et al., 2022) have advanced that achieving superior procurement performance cannot be at the expense of employing emerging technologies. Although quite enough is documented on the role of technology in procurement literature (Manyega, 2015; Manyega and Okibo, 2015; Kumar et al., 2018; Van der Westhuizen et al., 2020; Schramm et al., 2020; Yan et al., 2020). It is unclear how technology dynamism may influence procurement performance in the Ghanaian public sector. This study is therefore conducted to examine how technology dynamism influence procurement performance in Ghana.

1.2 Problem Statement

As stated earlier, procurement consumes a significant part of government budget, hence improving procurement performance will lead to great savings as well as enhance service delivery in the public sector. The procurement functions in the public sector especially in Africa have been ineffective and inefficient characterised by massive corruption (Cherop, 2016). Extant literature (Damoah et al., 2018; Rasul et al., 2018; Jacob and Lawan, 2020; Muhwezi et al., 2020; Gray, 2021) provide series of evidence reading poor procurement performance in the public sector could be

traced to poor supplier selection, poor contract management, poor planning, resolve to allocate staff completely, corruption and conflict of interest. Additionally, the World Bank (2001) identified corruption and poor supplier selection as obstacles to public procurement performance. Despite varied interventions to curb the poor procurement performance especially, in public sector organizations in emerging economies, the situation in Ghana continues to worsen coupled with the low-value high volume procurement has stimulated many organisations to consider the introduction of electronic procurement due to its simplicity, speed, and cost-saving as compared to paper-based procurement (Moon, 2005). Therefore, with time governments, have been implementing emerging technological applications in procurement practices like electronic data interchange and web-based procurement practices, particularly electronic and reverse auctions, electronic requests for proposal and bidding, electronic signatures, electronic orders, and purchasing cards (Moon, 2005). Despite some expected benefits from electronic technology usage in procurement, the application of technology has been faced with many obstacles such as limited integrations among procurement stakeholders, legislative requirements, implementation costs, and security challenges (Mccue & Roman, 2012; Moon, 2005). These benefits were not achieved in some areas, though in other areas, there were success stories (Mccue & Roman, 2012; Moon, 2005). Despite many organisations worldwide investing much in information technology to gain a competitive advantage through information technology usage (Tippens & Sohi, 2003), there are conflicting views on whether technology usage can positively impact organisations' performance. This is due to the contradictory results as some studies support the significant contributions of technology usage towards performance (Alsetoohy & Ayoun, 2018; Ateto et al., 2013 & Quesada

et al., 2010) while others showed an insignificant relationship between technology usage and performance (Devaraj et al., 2007; Jawabreh et al., 2013 & Wang et al., 2006). These conflicting views have alerted managers who now have realised a need to learn how best to strategically use information technology to realise a positive performance (Tippens & Sohi, 2003). The question that remains unanswered lies whether the dynamism in technology over the years enhanced procurement performance in the public sector. Hence, therefore, has been several calls on both industry and academia to look for a lasting remedy to remedy the poor procurement issues in the public sector. In response, strategic supplier selection and operational supplier selection have emerged as essential strategies in procurement management that could be useful in enhancing procurement performance. Despite the growth of discourse on technology in procurement literature, to date, no studies so far have been conducted to examine how technological dynamism may influence procurement performance. Apart from the lack of a clear understanding of regarding how technological dynamism may influence procurement performance, earlier studies lack empirical and theoretical support (Xenophon et al., 2012). Though public sector organisations have implemented different technological innovations over the years, it remains unclear which could be more useful in achieving procurement performance in the public sector. This study seeks to fill the theoretical gap by examining how technological dynamism may influence procurement performance through the resource-based view perspective. The author views the ability of procurement managers ability to use emerging technologies remain essential internal resources that organizations may ride on to achieve supplier performance. Thus, the firm's proficiency in leveraging its web-based technologies to interchange with other parties both inside and outside the

firm for buying and selling activities with suppliers could play essential support to boost the effect of technological dynamism on procurement performance. Thus, drawing from the contingency perspective, procurement performance may not just be enhanced through technological dynamism but also the role of e-business' proactiveness in the procurement process. This study, therefore, envisages that m's proficiency in leveraging its web-based technologies to interchange with other parties both inside and outside the firm for buying and selling activities with suppliers may play an essential role in delivering superior procurement performance through technological dynamism. This study closes the aforementioned gaps by examining technological dynamism affects procurement performance and the mediating role of e-businesses' proactiveness in the direct link between technological dynamism and procurement performance. Being among few attempts to examine the phenomena, this study makes a twofold contribution to procurement literature. The direct relationship between technological dynamism and procurement performance which has not yet been empirically validated is explored in this study and further expands the theoretical lens of procurement literature on how procurement entities may leverage emerging technologies to enhance procurement in the public sector. Secondly, this study introduced e-businesses' proactiveness as a mediating variable, which expands the context of research on procurement performance and facilitates the understanding of the boundary conditions that promote procurement performance.

1.3 Objectives of the study

The main objective of this study was to investigate how technological dynamism influences procurement performance in the Ghanaian Public, the sector as well as the mediating role of e-

business proactiveness. Based on gaps identified and discussed in the problem statement, three specific objectives were put forward. These objectives included

- i. To examine the effect of technological dynamism influences procurement performance.
- ii. To evaluate the relationship between e-business proactiveness and procurement performance.
- iii. To investigate the mediating role of e-business proactiveness on the relationship between technological dynamism and procurement performance.

1.4 Research Questions

- i. What is the effect of technological dynamism influences procurement performance?
- ii. What is the relationship between e-business proactiveness and procurement performance?
- iii. What is the mediating role of e-business proactiveness on the relationship between technological dynamism and procurement performance?

1.5 Significance of the Study

This study closed the aforementioned gaps by examining technological dynamism affects procurement performance and the mediating role of e-businesses' proactiveness in the direct link between technological dynamism and procurement performance. Being among few attempts to examine the phenomena, this study makes a twofold contribution to procurement literature. The direct relationship between technological dynamism and procurement performance which has not yet been empirically validated is explored in this study and further expands the theoretical lens of procurement literature on how procurement entities may leverage emerging technologies to enhance procurement in the public sector. Secondly, this study introduced e-businesses'

proactiveness as a mediating variable, which expands the context of research on procurement performance and facilitates the understanding of the boundary conditions that promote procurement performance. Theoretically, the study will also add to the literature in academia especially in Sub Sahara Africa by providing direction on procurement performances among procurement professionals of diverse cultural orientations. This study was an attempt to fill the chasm. Resource Based View and Principal Agency theory will be employed to understand the phenomena in the Ghanaian context. The literature again revealed that most research in procurement or buyer-supplier relationships has predominantly been done in private-sector organizations. However, there is very little empirical research of this nature in developing countries in Africa. This study saw this gap as one worth investigating especially in Ghana which is known to account for more than 50% of the national budget.

1.6 Research Methodology

The study employed a positivist research approach which made use of a quantitative methodology. Again, the study also adopted both descriptive and explanatory research designs. Combining these two designs enabled the researcher to describe the study variables in the Ghanaian context and also explore the relationship among the variables at the aggregate level. The study population comprised all public procurement departments in the various Ministries, departments, and agencies. A sample of One hundred public institutions were included in the study. After selecting the organisation, the researcher further used the purposive sampling method to select individuals that are directly involved in the subject under investigation (procurement managers and officers). The study conducted an extensive literature review to help to discover the academic writings

supporting the relevant topic and the research hypotheses. Again, the study used primary sources of data to validate the results produced in literature through field survey using questionnaires adopted from previously validated instruments. After the data collection, the primary data that has been gathered from the field will be vetted for accuracy and reliability. The questionnaires that have been adequately filled will be coded into excel for analysis. This study will employ two data analysis approach i.e., descriptive and inferential analysis using multivariate data analyses such as Structural Equation Modelling (SEM) and factor analyses in order to fulfil set objectives in chapter one. Descriptive analysis will be based on information provided by respondents concerning their organization (demographical data), which include profile of the organisation and the respondents. The essence of the descriptive analysis is to test for normality and this included frequencies, percentages, means, skewness and kurtosis statistics. The motive of this analysis was to ensure that data gathered are suitable for covariance based-SEM analysis. It is done to check for missing data, outliers, and data distribution (Hair et al., 2017). Inferential analysis was used to test the hypothesis in the study.

1.7 Scope of the study

The scope sets the context and boundaries of the research. Contextually the study focused on procurement units of public sector organisations across the country. Though procurement performance is affected by several factors, this study focused on how technological dynamism influences procurement performance in the Ghanaian Public sector.

1.8 Limitation of the study

The study had some limitations. Though prior studies recommend the use of a single respondent in a study of this nature, however, in practice no single person controls or manages the entire SC, This study, therefore, was limited by using a single respondent. Additionally, including a mediator in the relationship would be more robust and valid in contexts specific to service delivery or the public sector. It would have been useful to employ a longitudinal research design in understanding the relationship. Though the study had no issues of common method bias despite using a single respondent, it is important that future studies considered multiple respondents from each firm. Again, future researchers can also investigate the conceptual model using other sectors of the economy of Ghana such as the service sector and nonprofit organisations.

1.9 Organisation of the study

The study is structured into five chapters. Chapter One introduces the background of the study, the research problem, research objectives, research questions, justification or significance of the study, the scope of the study, limitations of the research, and an overview of the research methodology. Chapter Two reviews relevant literature related to social capital theory, innovation, and firm performance. The literature review encompasses both theoretical and empirical sections. The various concepts of the study will also be reviewed in Chapter Two. Chapter Three elaborates on the research methodology. The chapter discusses the study design, population of the study, sampling, data collection, data processing, data analysis, and ethical consideration. Chapter Four of the study presents analyses of the data and discusses the result. Chapter Five summarised the

research result, makes the necessary conclusions, and recommended appropriate and feasible policy and managerial measures for improving procurement in Ghana.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter two of this thesis is organized into four main sub-headings. The chapter provides information organized under conceptual review, theoretical review, empirical review, and finally the research model and hypotheses development. The Conceptual review section provides definitions, operationalisations, and how the constructs have been used in this study. The theoretical review section also provides the theoretical underpinnings of the study. The various prepositions proposed in this study were depicted using a conceptual framework and various relationships were well discussed. The Chapter ends with a summary that also highlights the gap explored in this study.

2.2 Conceptual Review

This section provides definitions of variables and how they have been used in the study. The research work consists of three (3) variables (technological dynamism, Procurement performance, and E-business proactivity). However, these variables have been operationalized in the subsequent sections below.

2.2.1 Technological Dynamism

Technological dynamism is the sense of rapid changes in an industry's technological growth that a firm is involved in. Zirena et al (2021). Technology dynamism compels businesses to alter their offerings to remain competitive (Rodrigo-Alarcón et al., 2020; Hou et al., 2019). The pace of unpredictable change in a firm's environment is called dynamism, and it has an impact on

managers' capacity to foresee relevant future events, their effects on the company, and how to respond to them (Parra Requena, et al., 2021). Change efforts are now more widespread in many firms, according to Wang, et al. (2022), since the environment is changing swiftly and in frequently unforeseen ways. To be more successful and efficient in the identification and exploitation of new emerging possibilities, organizations tend to adopt innovative behaviour, behave proactively, and display higher degrees of risk, as stated by Rauch et al. (2022). Garca-Villaverde, (2018) also noted that businesses dynamically interact with their surroundings to adjust their plans to environmental enactment rather than merely react to it. According to Chen et al. (2021), technological dynamism pushes managers to adopt more proactive conduct to tap into new market niches and foresee the emergence of fresh competitors. Meijer, Rodrigo-Alarcón, (2020) remarked that greater technological dynamism might drive a firm's management to take on greater risk and take activities that are more likely to fail. According to Garca-Villaverde et al. (2018), technological dynamism pushes managers to adopt an entrepreneurial mindset by showing greater inventiveness, proactivity, and risk-taking to deal with constant change and to recognize and take advantage of possibilities that arise in the environment. Technological dynamism, as defined by Wu, Levitas, and Priem (2005), is the pace of change and unpredictability of emerging technologies. Additionally, the authors divided technological dynamism into three groups, namely: The use of internet technology and an entrepreneurial mindset are considered as internal to the company, while technological turbulence, which is dynamism's exterior side, is seen as its external. According to Garca-Villaverde et al. (2018), information technology (IT) adoption, sometimes referred to as the degree to which a company adopts and integrates various IT-enabled operation

systems and tools, is a key indicator of technological dynamism. The most significant technical advancement that has been associated with increased productivity is likely information technology (Lin, et al., 2020). On the other side, it has been discovered that entrepreneurial orientation, which is defined as organisation propensity to adopt creative and entrepreneurial processes, practices, and decision-making (Eresia-Eke, et al., 2019), is a predictor of successful business performance. Last but not least, technical turbulence is the external aspect of technological dynamism that a business must deal with. It is defined as the industry level-rate of product and process change (Lin, et al., 2019). Rapid technological development creates chances for growth and flourishing as well as pressure to succeed. Because of this, businesses using emerging technologies that were changing quickly are probably to obtain a competitive edge through innovation (Jaworski and Kohli 1993). The concept of technological dynamism used in this study will be taken from Zirena, et al. (2021), who claim that it relates to the sense of rapid changes in the technical development of the industry in which the business is involved.

2.2.2 Procurement Performance

Procurement performance is essentially the effective and efficient acquisition of products and services (Sulaeman, et al., 2019). Procurement performance is said to be the outcome of two major components: purchasing efficiency and optimum effectiveness (Mugenyi et al., 2020). Procurement performance may be measured in a variety of ways, including procurement cost, procurement time, and procurement accuracy. It may be utilized by management to determine the numerous flaws in procurements and how to address them. It is also one of seven major variables, which include a suitable procurement strategy, well-coordinated management information, and

targeted procurement initiatives (Sellahewa, 2020). Butt (2021) pointed out that the purpose of supply chain procurement procedures is to improve the flow of merchandise from suppliers to consumers. This contributes to a greater comprehension of the systems and coordination of operations, which significantly improves operational performance (Abbas, et al., 2021). According to Osuga et al. (2015), increased attainment of organizational goals for procurement and decreased procurement expenses are both related to operational success in procurement. According to Rotich et al. (2021), procurement performance refers to the efficacy and efficiency of procurement activities. For measuring the impact of purchase on operational performance, they developed eight indicators. According to Bartai and Kimutai, procurement achievement is related to cost reduction, increased profitability, guaranteed supply, quality improvements, and competitive advantage (2018). Performance, on the other hand, is the successful accomplishment of predetermined organizational goals and targets. This can be obtained for the least amount of money while still being effective (Mutuku et al. 2021). (Kariuki et al., 2018) define procurement as all actions necessary to get a product from the source to the ultimate location. The ability of the procurement function to achieve objectives and goals while incurring the fewest expenses is measured by procurement performance (Abbey and Ongâ, 2019). Effectiveness and efficiency are the two key components of procurement performance (Van Poucke et al. 2019). According to Van Poucke, et al. (2019), procurement effectiveness is the degree to which the predetermined goals and objectives are being achieved. It refers to the link between the execution of any human action as planned and real. Additionally, further clarifies that procurement efficiency, when referring to the planned and actual expenses, is the link between the resources needed to fulfill the specified goals and

objectives and their connected activities. As a result, the most significant performance driver for procurement is supplier performance. However, amid an economic crisis, the purchasing department plays an ever-more crucial role in the supply chain, making it crucial to track procurement performance (Batarfi, and Attia, 2021). Yumurtac Hüseyinolu, et al. (2020) indicate that a decrease in the price of raw materials and services might enable businesses to promote the pricing of their completed items in a competitive manner in order to attract customers. The quantity of money saved by the business serves as a clear performance indicator of the effectiveness of any buying department (Kakwezi, and Nyeko, 2019). The effectiveness of an organization has always depended on procurement, according to Cheptora et al. (2018). However, Rokkan and Haugland (2021) went on to add that due to the market's growing unpredictability, fierce rivalry, and concerns about an impending recession, procurement has become a hot subject for senior level management. The definition offered by Suleman et al. (2019) will be used in this study, which argues that procurement performance is only an effective and efficient way to acquire products and services.

2.2.3 E-Business Proactiveness

Proactivity is a forward-thinking attitude. It is a proactive approach to introducing innovative products, services, and/or operations in anticipation of future demand (Al Omoush, et al., 2018). According to Hicks (2021), proactiveness undoubtedly played a part in the 2008 global financial crisis. Proactivity stems from both the physical capacity to act and the intellectual ability to think,

including the ability to develop and use information, so that businesses may survive and even thrive in changing and unexpected settings (Nafei, 2016; Nissen & von Rennenkampff, 2017). E-business is defined as the use of internet technologies to connect customers, suppliers, business partners, and employees using at least one of the following: (a) websites that allow for online purchases, (b) websites for customer service, (c) intranets and enterprise information portals, (d) extranets and supply chains, and (e) electronic data interchange ("Information Week research survey" 1999). According to Ayantoye (2019), e-business has the ability to turn a company into a networked entity with seamless supply chains and value creation processes by aiding in the development and management of connections with consumers, suppliers, workers, and partners. Wang and Fefelov (2019) have stated that e-business has a widespread influence across the organization's structure, from the procurement division to the field sales force, and across a variety of its business activities, from internal management to supply-chain coordination. E-business technology may enhance the company's operations management system by enabling the real-time exchange of information across the supply chain, according to (Cassetta, et al., 2020; Ghahramani, et al., (2022). The ability of e-business technology to develop long-term operational benefits, however, may be diminished because it has been commoditized and is generally inexpensive for large businesses (Martnez-Caro et al., 2020). The capacity of an organisation to use web-based technologies to communicate both inside and outside of it to conduct business with suppliers and consumers is known as its e-business technology competency (Cassetta, et al.,2020; Krishnakumar, et al., 2022; Benitez, et al, 2018; So, et al., 2021; Cassetta, et al., 2020,). By supporting the improvement of gross margin, worker productivity, and operational talent

management, and operational excellence, e-business technology may support the growth of operational competence (Benitez, et al., 2017). According to Raymond, et al. (2015), there are three main types of e-business capacity. E-collaboration is one possible manifestation of the first kind. It entails integrating and disseminating data on the extended value chain connecting the company with its upstream and downstream business partners through the Internet or extranets. This enables participants in a certain industry, sector, or network organization to work together on the creation, development, production, and administration of goods and services at various stages of their life cycles (Raymond, et al., 2016). E-commerce is a second type of e-business capability. Due to the transactional nature of this skill, successful business development has become easier (Tang, and Konde, 2020). E-commerce refers to the capacity to purchase and sell products and services through the Internet and using web-based tools (Wirtz, 2021). The last kind is e-intelligence capabilities (also known as e-business intelligence), which enables an organisation to scan its technical, commercial, and competitive environment in search of methods to enhance its operations and decision-making as well as look for new product-market prospects (Hill, and Scott, 2004). This study adopts the definition provided by (Cassetta, et al., 2020; Krishnakumar, et al., 2022; Benitez, et al, 2018; So, et al., 2021; Cassetta, et al., 2020), which states that e-business technology capability is the firm's proficiency in leveraging its web-based technologies to interchange with other parties both inside and outside the firm for buying and selling activities with suppliers.

2.3 Theoretical Review

To focus the research direction, one underpinning theory was used as a research foundation in supporting and addressing the gap, and as a guide to align this research into an appropriate direction. In this section, the researcher discusses the underpinning theory that formed the basis to investigate and study the phenomenon of technological dynamism, procurement performance, and E-business proactivity. The driving theory of this study is the knowledge-based view theory. Theoretical frameworks provide a clear prism or context through which a subject is studied; it explains the context and the connections between the various factors and dimensions.

.3.1 Knowledge-Based View Theory

Knowledge-based view theory (KBV), which is a management concept of organisational learning that provides businesses with methods to attain competitiveness, builds on resource-based view theory (RBV) (Martin & Javalgi, 2019). The idea views information and knowledge as the company's most strategically important resources (Grant, and Phene, 2022). According to the principle, businesses exist to produce, transmit, and use knowledge as a competitive advantage (Hohberger et al., 2020). In light of this, Yli-Renko et al. (2020) contend that businesses can utilize knowledge to boost competitiveness and achieve higher procurement performance because it is challenging to replicate and transmit. In fact Paswan and Panda (2020) argued that businesses may adapt to market changes quicker than their rivals and gain supremacy by coordinating, synthesizing, and integrating internal and external knowledge. Furthermore, Schütz et al. (2020) state that KBV is an organizational strategy that serves as the foundation for building human capital engagement in the organization's everyday operations. Following Grant (2015) and Yli-

Renko et al., (2020) suggestions, KBV was included in this study to evaluate the effect of technological dynamism in driving procurement performance and how e-businesses might affect this connection. The Knowledge-Based View (KBV) theory suggests that the knowledge and capabilities possessed by an organization are critical determinants of its competitive advantage. This theory emphasizes the role of knowledge as a strategic resource that enables organizations to create, transfer, and leverage information for competitive advantage. In the context of your query, let's explore the effects of technological dynamism on procurement performance and the mediating role of e-business proactiveness using the Knowledge-Based View. Technological dynamism refers to the rate at which new technologies are introduced and how quickly existing technologies become obsolete. In a rapidly changing technological environment, organizations must adapt their procurement processes to remain competitive. High technological dynamism can affect procurement in various ways. New technologies may offer opportunities for cost reduction, efficiency improvement, and innovation in procurement processes. On the other hand, the constant need to adapt to new technologies may pose challenges, such as the need for continuous training and the risk of investing in technologies that quickly become outdated. According to KBV, an organization's knowledge base is a key strategic resource. In the context of technological dynamism, organizations need knowledge to understand, adopt, and integrate new technologies into their procurement processes effectively. Organizations with a strong knowledge base can develop procurement capabilities that allow them to navigate technological changes more effectively. These capabilities may include the ability to assess the relevance of new technologies, integrate them into existing processes, and exploit them for competitive advantage. E-business

proactiveness refers to an organization's proactive stance in adopting and leveraging e-business technologies. In the context of procurement, this could involve the use of electronic procurement systems, online collaboration tools, and other digital platforms to streamline processes. E-business proactiveness can mediate the relationship between technological dynamism and procurement performance. An organization that is proactive in adopting e-business practices may be better equipped to handle the challenges posed by technological dynamism. For example, a proactive approach to e-business can enhance information flow, communication, and collaboration in procurement processes, ultimately influencing overall procurement performance. In summary, the Knowledge-Based View theory provides a framework for understanding how organizations can leverage their knowledge and capabilities to adapt to technological dynamism in the procurement domain. The mediating role of e-business proactiveness highlights the importance of proactive digital strategies in mitigating the challenges and exploiting the opportunities presented by rapidly evolving technologies.

2.4 Empirical Review

This section provided the relationship between the constructs by reviewing the literature on the findings from earlier related studies. The relationships included technological dynamism and procurement performance, and the mediating effect of e-business proactivity on the relationship between technological dynamism and procurement performance.

2.4.1 Technological Dynamism and Procurement Performance

Lin et al. (2019) investigated the performance effect of technological dynamism in Russian enterprises and the extent to which ownership mattered in terms of the technology dynamism-performance relationship. Data was gathered from 875 Russian businesses. A regression analysis was used to examine the data. The findings suggested that information technology adoption, entrepreneurial attitude, and technological turbulence drive performance in Russian enterprises and that the beneficial effects of technological turbulence are larger in private than in state-owned Russian firms. The study suggested that future research employ longitudinal designs to better capture the historical context of Russian management in transition.

Kumar and Bhatia (2021) looked at the mediating impact of key elements on this connection and if environmental dynamism (ED) might motivate businesses to adopt I4.0 technology. Partial least squares were used to examine survey data from India's industrial sectors (PLS). The findings demonstrated that environmental dynamism propels businesses toward I4.0 and that I4.0 has a favorable impact on performance outcomes. As businesses may only use particular I4.0

technologies, the study suggested that further research be done on analyzing the facilitators and results of specific technologies.

Innocent et al. (2016) investigated the factors influencing the adoption of e-Procurement and the effects that this e-Procurement had on New Artel, Rwanda's procurement performance. Data was gathered from New Artel's Rwandan workers. SPSS 17 was employed to analyze the data. The results indicated that adopting e-Procurement had a beneficial impact on New Artel, Rwanda's procurement performance. According to the report, firms should focus on aspects that affect how employees perceive risks to increase employee acceptance of e-procurement systems.

Sabahi and Parast's (2020) analyzed the impact of social entrepreneurship orientation on nonprofit organizations' performance. 135 non-profit organisations in Portugal provided the information. Even though there was no influence on the acceptance of social risks on performance, the studies showed a favourable effect on the social innovation and social proactivity components. Future research should create a scale to quantify the reciprocity dimension.

Deslatte and Swann (2020) looked at the connection between organizational capabilities, strategies, perceived performance, and the entrepreneurial orientation of a company. A countrywide survey of American local governments as well as interviews with local government administrators were used as part of a mixed methods strategy to obtain data. A Structural equation modelling technique was employed to analyse the data. The results showed that entrepreneurial orientation has a favorable impact on how sustainability performance is viewed. Future studies on entrepreneurial inclination should concentrate on managers' justifications and risk aversions.

2.4.2 Technology Dynamism and E-business Proactiveness

Al-Omoush, (2020) conducted research to investigate the role of top management support and organisational capabilities in achieving e-business entrepreneurship. Data were collected through a self-administered questionnaire from 26 manufacturing firms. The data were analyzed using SmartPLS. The results showed a significant impact of top management support on e-business entrepreneurship. The study recommended further research to replicate, targeting larger samples from different industries, countries, or regions to further validate its findings.

Sanaei and Sobhani (2018) did research on the impact of information technology on e-business strategy. A questionnaire was distributed to 1600 e-business company executives. A meta-analysis survey was done, with 130 publications published between 2010 and 2015 being reviewed and expert views gathered. The data was also analysed using structural equation modelling. According to the findings, different aspects of e-business strategy components may not be equally beneficial to diverse marketing strategies. Future research might define the differentiation approach based on goods and markets.

Al-Omoush et al. (2020) investigate the importance of social capital and collaborative knowledge generation in establishing e-business proactiveness in response to the COVID-19 problem. An online survey was utilized to collect data from industries that had to continue operating during the crisis in Jordan, such as the pharmaceutical and cleaning supplies sectors. The sample consisted of 198 managers. Partial least square techniques was used to analyse the data. The findings revealed that social capital and collaborative knowledge generation play an important role in establishing

e-business proactiveness in reacting to the pandemic. This study's research paradigm should be validated in future studies with bigger samples from diverse industries, nations, and locations to corroborate these findings.

Park et al. (2018) performed research to determine the impact of technology and market dynamism on the business performance of small and medium-sized companies (SMEs) that provide support services. Through a questionnaire, data were collected from 341 enterprises in South Korea's manufacturing industry. Smart PLS was used to evaluate the data. The findings showed that technology and market dynamism considerably reduced the influence of SME executives' decision-making on SME company success. The study revealed that when technology and market dynamism are strong, SME-supporting services are more successful in producing company performance.

Adam et al. (2019) investigated the links between entrepreneurial attitude and organizational performance, as well as the function of the external environment as a moderator between the two. The underpinning premise for the study was the Resource-Based View theory. A quantitative research design was used for the investigation. A questionnaire was used to collect data from 381 Malaysian internet firms. SMART PLS 3.0 was used to do structural equation modeling on the quantitative data. According to the findings, the entrepreneurial orientation characteristics of innovativeness, proactiveness, risk-taking, competitive aggressiveness, and autonomy have a considerable impact on financial and non-financial organizational performance. Future research

will focus on the potential of entrepreneurial attitude and external environment skills to sustain e-business performance in the face of business risks.

2.4.3 E-business Proactiveness and Procurement Performance

Mkansi, (2021) experimentally investigated the techniques employed by e-retail microbusinesses in order to potentially increase their e-business adoption. The data for the study was gathered using a qualitative multi-case study technique. The findings demonstrated that the real cost of adoption, the technology-organization-environment strategies used to lower the cost barrier, and how pursuing the cost barrier concurrently decreases some adoption barriers outside of the cost considerations were all disclosed. Future research might compare the unique characteristics of small clothes shops reported in this study to those of other small retail sectors or markets.

Adzroe et al. (2018) investigate the impact of utilizing e-business technology to enhance construction procurement. A qualitative multi-case study research design was used in this study. Purposive sampling was used to collect data from projects and government organizations. Thematic analysis was used to examine the data. According to the findings, the deployment of e-business technology has a favorable impact on the capacity and competency of Ghanaian construction micro and small firms. The study found that it is critical to recognize that this plan is a grassroots approach to making a sound procurement decision to adopt an e-business strategy inside Ghana's construction sector.

Chinomona and Bikissa-Macongue (2021) performed a study in southern Gauteng to investigate the impact of supplier collaboration in e-businesses, information sharing, and information quality

on customer collaboration in e-businesses. The study used a positivist perspective and quantitative technique. Data were gathered from 300 suppliers, consumers, and workers of e-businesses in South Africa's southern Gauteng area. To investigate the hypothesized correlations between constructs, data were analyzed using the Statistical Package for the Social Sciences (SPSS) 26.0 and Smart PLS 3.0. Supplier collaboration in e-business, information sharing, and information quality were discovered to be factors of customer collaboration in e-business. To acquire a better view of the study, future studies might employ alternative approaches, such as the mixed-method.

Putri and Dewi (2019) investigated the impact of online businesses on unemployment in Indonesia. The descriptive technique was utilized in the study to identify associated factors on online business and unemployment in Indonesia, as well as prior research on online business development and unemployment. According to the findings, online businesses have the potential to lower the number of jobless individuals in Indonesia. According to the report, online businesses can help reduce unemployment in Indonesia.

Paștiu, et al. (2020) looked at how e-antecedents loyalties have altered how they affect customer attitudes and perceptions of e-commerce websites. 523 customers of home and electrical products in Romania provided the information. Structural equation modeling was used to examine the data. The results demonstrated how customers' e-loyalty, contentment, and trust are directly impacted by how easily accessible websites are. Future studies need to be expanded in terms of sampling a broader variety of consumers from other European nations that have been badly impacted by the COVID-19 epidemic, as well as a balanced number of respondents who are both male and female.

2.4.4 The mediating Role of E-business

Akovi Jovanovi et al., (2020) did a study to investigate the effect of internet sales Channels in mediating the relationship between e-Commerce and Firm Performance in EU countries. The data from the Flash Euro barometer 439 Survey titled The Use of Online Marketplaces and Search Engines by Small and Medium Enterprises was used to run the Ordinary Least Squares (OLS) model. Certain forms of internet sales channels were shown to favorably mediate the association between e-commerce and company success. The study suggested that future research look at additional mediating factors including firm competition, investment in information technology equipment, and so on.

Yaqub et al., (2022) investigate the function of web design, e-payment, and e-traceability in improving customer satisfaction, with consumer behavior acting as a mediator, in rising bricks and clicks business trends in South Punjab. A five-point Likert scale questionnaire was utilized to acquire quantitative data from the target population of South Punjab using a random sample approach. The findings indicated that online design, e-payment, and e-traceability have a key influence in growing customer satisfaction in South Punjab, with consumer behavior acting as a moderator. Future academics should concentrate on the function of information and communication technology, purchasing power, and digital marketing in boosting South Punjab consumer happiness.

Hussain et al. (2020) explored the impact of e-commerce in mediating the performance of small and medium-sized firms (SMEs) through organizational and environmental variables. The study

used a cross-sectional survey technique. 700 senior and middle-level managers from manufacturing SMEs in Pakistan provided data. Partial least square structural equation modeling was used to examine the data (PLS-SEM). According to the data, top management backing and competitive pressure both have a considerable favorable influence on the usage of e-commerce direct and mediation. Future work should also adhere to the theoretical foundations of dynamic capacity theory by taking into account internal and external dynamic resources in order to gain a competitive advantage.

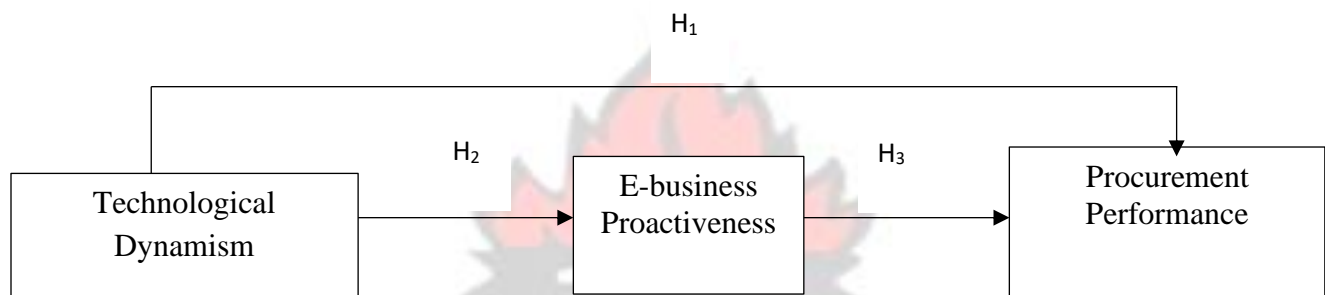
Qalati et al., (2021) studied the effects of technology-organizational-environmental (TOE) variables on the adoption of social media and the performance of SMEs in developing countries. The TOE framework was used in this study to identify factors of social media adoption and SMEs' performance. Data were received from 423 respondents working in Pakistani SMEs. For the route analysis, partial-least-squares structural equation modeling (PLS-SEM) was applied. According to the findings, there was full mediation between technological variables and SMEs' performance, and partial mediation between organizational and environmental factors and SMEs' performance. Future research might also look at comparative comparison in the context of SMEs and health sectors, both of which have received little attention in Pakistan.

2.5 Conceptual Framework

The section explains the conceptual framework and underlying assumptions that relate the technological dynamism and procurement performance as well as how e-business proactivity affect the relationship. The study examined the direct effect of technological dynamism on

procurement and the indirect role of e-business proactivity in the technological dynamism and procurement performance link.

Figure 2.1 Conceptual Framework



2.6 Hypotheses Development

2.6.1 Effect of Technology Dynamism on Procurement Performance

Performance assessment is crucial for businesses because managers rely heavily on performance data when making decisions (Anwar, and Sun, 2015). Given the power of technology, firms are placing a premium on procurement performance as a critical tool. Because firms/organizations want the greatest services and want to buy items or services of the proper quality, price, and quantity that are supplied on time, selecting for superior procurement performance might contribute to the fulfillment of these wishes. But when firms adjust to the dynamism of technology, the best results in terms of procurement performance may be obtained. Businesses are working hard to enhance their operations in an effort to combat the pressure on income and costs. One such endeavor is the incorporation of technology dynamism in their procurement processes (Mishra et al, 2021). According to studies, firms that have used electronic procurement have benefited from increased transparency, financial savings, a decrease in the time and effort required for

procurement, and increased convenience (Zhou, et al., 2019). Studies on technological dynamism in supply chain management, value chains, and procurement show a correlation between technology dynamism and successful public procurement (Alsetoohy & Ayoun, 2018; Belisari et al., 2019; Cholette et al., 2019; Karthik & Kumar, 2013; Marinagi, Trivellas, & Sakas, 2014; Svidronova & Mikus, 2015; Yu et al., 2016). The following hypothesis was generated regarding technological dynamism and procurement performance based on these empirical scraps of evidence:

H₁. Technological Dynamism has positive and significant effect on procurement performance.

2.6.2 Effect of Technological Dynamism on E-Business Proactivity

The Internet in particular and technological dynamism in general are offering potential (and hazards) for significant economic and commercial transformation (HC and Gusaptono, 2020). Investment in technology innovation and electronic business, often known as e-business or EB, is the practice of conducting commercial operations online along the value chain. Although the literature has always been interested in the commercial value of technology dynamism (Cidik, 2019), scholars and practitioners are more concerned than ever with the problem of e-business payback as a result of the shifting economic settings today. The ability of a company to use web-based technologies to communicate both inside and outside of the company for purchasing and selling operations with suppliers and consumers is referred to as technological dynamism in e-business (Soto-Acosta, et al., 2016). Existing technological expertise is a vital resource for e-business investment, use, and value. Since e-business is considered as a technology-driven

innovation, its implementation calls for technical expertise and organizational familiarity with relevant technologies (Chatterjee et al., 2021). Companies are more likely to have the necessary capabilities for e-business transformation when they have more expertise with associated technology (Sukoco, et al., 2021). These businesses are more likely to use e-business and benefit from it (Zhu,. and Lin, 2019). This suggests the following hypotheses:

H₂. Technological dynamism has positive and significant effect on E-Business proactivity.

2.6.3 Effect of E-Business Proactivity on Procurement Performance

Businesses have used e-business efforts across sectors to more effectively manage both their internal business operations and their environmental interfaces (Fernando, et al., 2019). The management of inter-organizational processes is significantly impacted by e-business systems and procedures that make use of widely available platforms like the internet and web browser (Pappas, et al., 2018). Since technology cannot improve company performance unless it is employed, e-business utilization is connected to procurement performance (Jeyaraj, 2020). E-business helps businesses become more responsive to market demands and strengthen client connections because it provides greater information about downstream markets. E-business inside the company has the ability to expedite corporate procedures, boosting operational effectiveness and employee productivity (Nguyen, 2022) E-business may enhance information flow and promote online integration with suppliers and business partners because of the Internet's extensive connection (Zhu, et al., 2020). These factors imply that implementing e-business would have an influence on

performance (value generation) along these dimensions. Therefore, we propose the following hypothesis:

H₃. E-Business proactivity has a positive and significant impact on procurement performance.

2.6.4 The mediating Role E-Business Proactivity

E-business expands the range of products available to customers in practically every industry since it allows customers to now contrast and evaluate the offers of suppliers throughout the world. Since e-business adoption boosts competitiveness by modernizing a firm's operations, goods, and practices, it has grown quickly in popularity in recent years (Jelassi and Martnez-López, 2020). Implementing e-business may have indirect effects on performance in a variety of ways, such as the growth of collaborative partnerships, knowledge management (KM) techniques, or the invention of new procedures, goods, or services (Kanellopoulos, and Tsekouras, 2022; Popa, et al., 2018). Understanding the factors that led to the adoption of internet-based technologies as well as e-business and its effects on output or value creation has become increasingly important (Noor, et al., 2019; Bordonaba-Juste, 2022). Various software programs, hardware elements, mobile applications, cloud computing, and the internet make up e-business technology (Perera, and Perera, 2021; Alam, et al., 2022). When these technologies are used in business operations, organisational productivity and efficiency rise, costs fall, and the market is expanded (Adzroe, and Awuzie, 2018). Additionally, it has been noted that it has the ability to enhance performance by offering an integrated business environment where communication and information flow remain crucial elements (Chiş, et al., 2018; Ziyae, et al., 2019). Issa and Lee (2020) noted that the deployment of

e-business helps to increase the effectiveness of procurement. E-business utilisation, according to Jeyaraj (2020), is linked to procurement performance since technology cannot increase company performance until it is employed. As a result, the research proposed that:

H₄. E-business proactivity mediates the relationship between technological dynamism and procurement performance.



Table 2.1 Literature Review

Author/Year	Country	Purpose	Theory	Method	Findings	Future Studies
Lin et al. (2019)	Russia	To investigate the performance effect of technological dynamism in Russian enterprises	organisational learning theory	Quantitative	Information technology adoption, entrepreneurial attitude, and technological turbulence drive performance in Russian enterprises	future research employ longitudinal designs
Kumar and Bhatia (2021)	India	To Investigate if environmental dynamism (ED) might motivate businesses to adopt I4.0 technology	Human-Organization-Technology” (HOT) theory	Quantitative	environmental dynamism propels businesses toward I4.0 and I4.0 has a favourable impact on performance outcomes	Further research be done on analyzing the facilitators and results of specific technologies.
Sabahi and Parast's (2020)	Portugal	TO analyzed the impact of social entrepreneurship orientation on nonprofit organizations' performance.		quantitative	Favourable connection between social innovation and social proactivity components	Future research should create a scale to quantify the reciprocity dimension.
Innocent et al. (2016)	Rwanda	To examine the effects of e-Procurement on New Artel, Rwanda's procurement performance		Quantitative	Adopting e-Procurement had a beneficial impact on New Artel, Rwanda's procurement performance.	

Deslatte and Swann (2020)	U.S.	To look at the connection between organisational capabilities, strategies, perceived performance, and the entrepreneurial orientation of a company.		Quantitative	Entrepreneurial orientation has a favorable impact on sustainability performance.	Future studies should concentrate on managers' justifications and risk aversions
Sanaei and Sobhani (2018)		To investigate the impact of information technology on e-business strategy		Quantitative	different aspects of e-business strategy components may not be equally beneficial to diverse marketing strategy	Future research might define the differentiation approach based on goods and markets
Mkansi, (2021)	South Africa (SA) and the United Kingdom (UK)	To investigated the techniques employed by e-retail microbusinesses in order to potentially increase their e-business adoption	Resource-based theory (RBT)	Qualitative	Pursuing the cost barrier concurrently decreases some adoption barriers outside of the cost considerations.	Future research might compare the unique characteristics of small clothes shops
Al-Omoush et al. (2020)	Jordan	To investigate the importance of social capital and collaborative knowledge generation in establishing e-business proactiveness in response to the COVID-19 problem.	resource-based view theory	Quantitative	Social capital and collaborative knowledge generation play an important role in establishing e-business proactiveness	The study's research paradigm should be validated in future studies with bigger samples.
Adam et al. (2019)	Malaysia	To investigate the links between	Resource-Based View theory	Quantitative	Entrepreneurial orientation has a	Future research will focus on the potential

		entrepreneurial attitude and organisational performance.			considerable impact on financial and non-financial organizational performance.	of entrepreneurial attitude and external environment skills to sustain e-business performance.
Chinomona and Bikissa-Macongue (2021)	South Africa	To investigate the impact of supplier collaboration in e-businesses, information sharing, and information quality on customer collaboration in e-businesses	Knowledge-based view theory	Quantitative	Supplier collaboration in e-business, information sharing, and information quality were factors of customer collaboration in e-business.	Future studies might employ alternative approaches, such as the mixed-method
Paștiu, et al. (2020)	Romania	To look at how e-antecedents' loyalties have altered how they affect customer attitudes and perceptions of e-commerce websites.		Quantitative	Customers' e-loyalty, contentment, and trust are directly impacted by accessible websites.	Future studies need to be expanded in terms of sampling a broader variety of consumers from other European.
Akovi Jovanovi et al., (2020)	EU countries	To investigate the effect of internet sales Channels in mediating the relationship between e-Commerce and Firm Performance.		Quantitative	Certain forms of internet sales channels were shown to favorably mediate the association between e-commerce and company success	Future research looks at additional mediating factors including firm competition, investment in information technology equipment, and so on.
Yaqub et al., (2022)		To investigate the function of web design, e-payment, and e-traceability in improving customer satisfaction.		Quantitative	Online design, e-payment, and e-traceability have a key influence in growing customer satisfaction in South Punjab	Future academics should concentrate on the function of information and communication technology,

						purchasing power, and digital marketing.
Hussain et al. (2020)	Pakistan	To explore the impact of e-commerce in mediating the performance of (SMEs) through organisational and environmental variables.	Resource-based view (RBV) and Diffusion of innovation (DOI) theory.	Quantitative	Top management backing and competitive pressure both have a considerable favourable influence on the usage of e-commerce direct and mediation.	Future work should also adhere to the theoretical foundations of dynamic capacity theory by taking into account internal and external dynamic resources.
Qalati et al., (2021)	Pakistan	To study the effects of technology-organisational-environmental (TOE) variables on the adoption of social media and the performance of SMEs.	Diffusion of innovation (DOI) theory	Quantitative	There was full mediation between technological variables and SMEs' performance.	Future research might also look at comparative comparison in the context of SMEs and health sectors in Pakistan.

The table above summarise the results of earlier studies that have been conducted on the topic area. The results in the table shows that although studies have been conducted on the subject area, very little research has been done on the direct link between the constructs in the study. Little research has been done on the mediating role of e-business proactivity in the technological dynamism and procurement performance effect. The study was also rarely conducted in the sub-Saharan African continents. These findings have created a gap in research conducted in the topic area which makes this study unique. This study is therefore among the very first to unravel how technological dynamism drives procurement performance. The study also will add to the literature by examining the mediating effect of e-business proactivity in the relationship between technological dynamism and procurement performance.



CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents an outline of the various methods and strategies employed by the researcher to collect data, clean the data and analyze the data using the appropriate analytical tools. It looks at the research design, the population of the study, sampling technique and sampling size, data collection, data analysis, validity and reliability, and chapter summary.

3.2 Research Design

In terms of data collection, measurement, and analysis, the research design refers to how a study will be carried out. It establishes the conditions for data collection and analysis in such a way as to strike a balance between relevance to the study purpose and organisational efficiency (Larbi & Gyedu, 2021). The creation of that kind of planning and evaluation is for the most efficient research possible, resulting in the greatest amount of information. The goal of research design, to put it differently, is to collect as many available facts as feasible with minimum effort, time, and money (Liyanage, Kumara, & Withanawasam, 2016).

The study employed the cross-sectional descriptive survey design where deductive reasoning is applied for the quantitative data (Liyanage et al., 2016). Deductive reasoning is used to make logical conclusions after the analysis. The deductive approach is a method where the researcher uses theories as bases to conduct an investigation that would be used to determine the result of a theory (Owusu-Ansah & Poku, 2012). The deductive method is usually made of quantitative techniques. The quantitative technique uses a survey questionnaire where data are normally collected from respondents. Researchers that utilise quantitative approaches collect and analyse numerical data to understand, forecast, and/or control occurrences. It provides an in-depth insight

into the specific testable study and focuses on examining the relationship between variables (Quansah, Ankoma-Sey & Asamoah, 2019).

The survey method is employed for the quantitative study because it examines a sample of the population to produce a quantitative or numeric depiction of attitudes, practices, and opinions. Through face-to-face questionnaire administration, primary data was acquired in the quantitative research design. Usage of the survey method was considered to be efficient and economical; it brings many advantages to the researcher; For instance, it is economical compared to interviewing, authorizes secrecy, and could produce additional truthful answers, besides it has the possibility of eliminating prejudice owing to wording questions differently with diverse respondents (Kothari, 2012; Durepos and Wiebe, 2019).

Subsequently, the use of the quantitative technique was employed to help in understanding the underlying reasons of respondents to issues of investigate how technological dynamism influence procurement performance in the Ghanaian Public sector as well as the mediating role of e-business proactiveness.

This study adopted a quantitative method which will guide the sampling techniques, designing of research instruments, and eventually analysis. As defined by Ragab and Arisha (2018), a quantitative study is a research methodology that explains a phenomenon through the collection of numerical data that is then evaluated using statistical methods. When a researcher uses methods of inquiry such as experiments and surveys, the researcher gathers data on predefined instruments that produce statistical data, which is referred to as a quantitative approach (Anderson et al., 2018; Ragab and Arisha, 2018). The quantitative research approach was chosen on the basis that it produces accurate and measurable data that can be generalized to a broader population (Jayasingha & Suraweera, 2020). Aside that, it is ideal for evaluating and verifying already known concepts

about how and why events occur by testing hypotheses developed before data collection. In general, quantitative research is regarded as a deductive approach to the investigation (Ragab and Arisha, 2018).

The positivism research philosophy which is the underpinning philosophy for quantitative research can be considered to fit well with the objectives of the research study based on the above approaches. Subsequently, the study employed quantitative methods of data collection in a single study according to the nature of the study. This study uses the existing RBV and PAT as underpinning theories in the hypotheses development. Its purpose is to assess theoretically formulated hypotheses regarding the impacts of a collection of study variable constructs, as well as to use reliability and validity to appraise the results and generalize them. Proceeding to this, the investigator will optimize the principles of positivism philosophy from the epistemological standpoint.

3.3 Population of the study

The population is a wide range of subjects from which a sample should be taken (Quansah et al., 2019). The whole collection of all units of analysis that a researcher wants to assess for a particular study is referred to as the target population (Babbie, 2015). It is essential to determine the study's target population before beginning a research endeavor. The population of the study comprised of senior managers including procurement officers, stores managers, warehouse managers and entity tender committee members.

3.4 Sample Size and Sampling Technique

The number of people or items to be included in the study is referred to as the sample size (Saunders & Rojon 2011). Several factors go into determining the sample size for a certain study, whether a researcher uses a qualitative or quantitative technique. Malhotra and Birks (Malhotra &

Birks, 2007). Even though the sample size is a critical decision for any research, there is no single method for selecting it (Seng, 2018). Hair et al. (2018) also suggested that the minimum sample size required for Structural Equation Modelling (SEM) technique is 200 or more and must represent the study population. These scholars argue that employing larger sample sizes increases the chances of mean, standard deviation, percentages, and other statistics reflected in the actual estimates of the population. Based on the arguments from these scholars, the researcher decided to increase the sample size by 15% for the survey (Shumilova and Cai 2015) to make room for anticipated low response rates. Therefore, to achieve a high accuracy rate, the current study employed a larger sample size by collecting data from a total of 286 respondents in the study. This number is presumed to be a suitable sample size based on the explanations as well as cues from previous studies (Hair et al. 2018; Sekaran and Bougie, 2019; Shumilova and Cai 2015).

The researcher must now determine the sampling technique for the study after determining the sample size. Every researcher's dream would have been to collect data from every single person in a population. This scenario is only achievable when the researcher is working with small groups of people. When the population of interest is big, however, this census approach is not always viable. Accessing potential participants is also costly, time-consuming, and complicated. As a result of these issues, studies that use huge populations, such as this one, have depended on sampling procedures to pick a representative sample from the population of interest (Malhotra, 2010). The process of picking a sufficient number of components from a larger population or constituents to use the data acquired from these sampled parts to make correct judgments and inferences about the overall population is known as sampling (Hair et al., 2009). In the literature, there are two types of sampling procedures: probability and non-probability sampling. In the case of study research, non-probability sampling is regularly used. While probability sampling is

routinely employed in surveys and experiments, case study research frequently uses non-probability sampling. Despite this, when the sample population is exceedingly big, some researchers continue to utilize non-probability sampling in quantitative studies (Saunders et al, 2009). Each element in the sample frame has an equal chance of being chosen in probability sampling, whereas in non-probability sampling, the opposite is true (Sekaran, 2003). As a result, valid inferences about the target population are difficult to make when nonprobability sampling is used. Even though non-probability sampling frequently relies on personal judgments and samples obtained using this technique may not always be a true reflection of the population, generalizations about the population can still be made (Malhotra, 2010). Non-probability sampling procedures include quota, purposive, snowball, and convenience sampling. Purposive sampling is the process of selecting participants based on the researcher's judgment of who has the relevant information. This study used the purposive sampling technique to draw managers from public sector organizations in Ghana. The study employed purposive sampling to collect relevant information from employees who are well knowledgeable about the phenomena under inquiry.

3.5 Methods of Data Collection

Two main sources of data exist in any research, this includes primary data and secondary data. While primary data refers to first-hand information gathered by the research for the research, secondary data deals with already existing data gathered for a different purpose. The choice of the data source in any research is dependent on the nature of the objective of the study. Considering the nature of this study, primary data is more suitable to be able to test the hypotheses proposed in Chapter two. The choice of primary data is justified by the quest to gather first-hand information on the views of how technological dynamism influence procurement performance in the Ghanaian

Public sector as well as the mediating role of e-business proactiveness. Data used in this study was therefore gathered using a well-structured questionnaire.

According to Sekaran (2003), data can be acquired in a variety of methods in various circumstances. Interviews (electronic, telephone, and face-to-face), survey surveys (given directly or electronically), observations (videos and audio), and motivating tactics are among them (p. 221).

While all of these data gathering methods are significant, the survey questionnaire method was chosen more suited for this study's data collection due to the study's goal and objective, which is to evaluate the interrelationships among variables using a quantitative approach.

The survey method is a way of gathering information about a big group of people's perceptions, judgments, and attributes (Malhotra & Birks, 2007). The basic purpose of surveys, according to positivist philosophy, is to create systematic observation using organized research questions to give uniformity and standardization (Bryman & Bell, 2015). For researchers who want to collect primary data about a group that is too vast to examine or observe directly, a survey is usually the best option.

According to Babbie (2004), a survey approach entails the researcher selecting a representative sample with characteristics that mirror the larger population, as well as the use of well-developed standardized questionnaires to ensure that all respondents reply in the same way. The strength of the survey approach, according to Malhotra and Birks (2007) and Saunders et al. (2009), is found in its standardized measurements. The data is usually quantitative and may be compared and examined using a variety of statistical approaches with ease (Creswell, 2014). Again, employing a questionnaire for data collection makes tabulation and data analysis easier and more straightforward, as well as provides some level of reliability (Smith & Albaum, 2005).

While the survey method is usually used when a study tries to answer questions of the "what" variety (Yin, 2009), it also allows the researcher to assess several variables and analyze the results using various statistics (Wimmer & Dominick, 2011). According to Sekaran (2003), the survey questionnaire data collecting approach is more efficient when the researcher can properly identify the constructions involved in the study as well as clear measures of the variables under investigation. In keeping with Sekaran's beliefs, this study used a survey approach to data collecting, to elicit direct replies from managers on their perceptions of the variables in the research model.

While the survey method is usually used when a study tries to answer questions of the "what" variety (Yin, 2009), it also allows the researcher to assess several variables and analyze the results using various statistics (Wimmer & Dominick, 2011). According to Sekaran (2003), the survey questionnaire data collecting approach is more efficient when the researcher can properly identify the constructions involved in the study as well as clear measures of the variables under investigation.

To test the study's hypotheses, the researcher develops a survey with a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) to measure all the study variables. The analysis relies on both a theoretical framework and several scholarly articles for the adoption of the study measurement items and the analysis of the results (Hosain, Mustafi, & Parvin, 2021; Ljubica & Cvelbar, 2016; Magnier & Crie, 2015; Lindh, Olsson & Williams, 2016). This study takes guidance from questions used in other related studies to suit Ghana's circumstances because they have been validated and tested for their reliability. All measures in this study adopted Likert scale questions because it makes questions easy and simple for respondents to answer as well as eases the researcher during analysis and gives reliable and quantifiable results.

3.6 Method of Data Analysis

The method of data analysis forms an essential component of any research such that the choice of the method of analysing data plays important role in the quality of findings, conclusions, and recommendations that are drawn from the data. Being a quantitative study, this study employed multiple quantitative techniques in analyzing the data to fulfill the goal outlined in chapter one. After gathering, all the data was compiled in excel for scrutiny. After the scrutiny, a few questionnaires that were found incomplete were discarded. The analysis employed both Statistical Package for Social Sciences (SPSS) version 26.0 and Smart PLS 3. The Statistical Package for Social Sciences (SPSS) was used for the analysis such as frequencies, means, standard deviations, independent sample t-test, correlation, and exploratory factor analysis. Smart PLS-SEM was used for Confirmatory Factor analysis, Structural Model evaluation, and other models fit indices that were explored in this study.

3.7 Validity and Reliability

3.7.1 Validity

A crucial aspect of research is ensuring that the instrument created to assess specific concepts actually and accurately measures the concept. The validity, according to Ringle & Ting, (2018), relates to the extent to which an instrument assesses its intended emphasis. The validity of the research instrument will be examined through face, content, convergent, and discriminant validity (Henseler, Ringle, & Sarstedt, 2015). For content validity, the important issue according to Kerr and Churchill (2001), is the methodology used to develop the questionnaire. Content validity was assessed through a thorough examination of the previous empirical and theoretical work of investigated constructs. The face validity of the questionnaire was assessed through the pretest exercise of the questionnaire with selected managers as well as the supervisors' expert review of

the applicability and suitability of the questionnaire to achieve the study's intended objectives.

To ensure that the constructs were truly distinct from each other and will capture some phenomena, both convergent and discriminant validity was established (Khalid et al., 2012; Kothari 2012). When two or more items are highly associated and measure the same construct, they are said to have convergent validity. In the views of Hair et al., (2011, 2014), to demonstrate the convergent validity of the reflective measurement model using PLS-SEM, a researcher needs to examine the average variance extracted (AVE) in which its value should be 0.50 or higher. Meanwhile, the discriminant validity which can be referred to as the degree to which the measures of one construct are distinct from another construct measurement, the study will examine two measures of the Fornell-Larcker Criterion and cross-loading (Henseler et al., 2015). The Fornell-Larcker Criterion postulates that “the latent construct shares more variance with its assigned indicators than other latent variables in structural model”. In statistical terms, it can also be said that each latent construct should have a greater average variance extracted (AVE) than the shared variance (squared correlation) of any other latent construct for the discriminant validity is to have the cross-loading value in which the indicators loading of the associated latent construct should be higher than its loading with other constructs remaining (Hair et al., 2011).

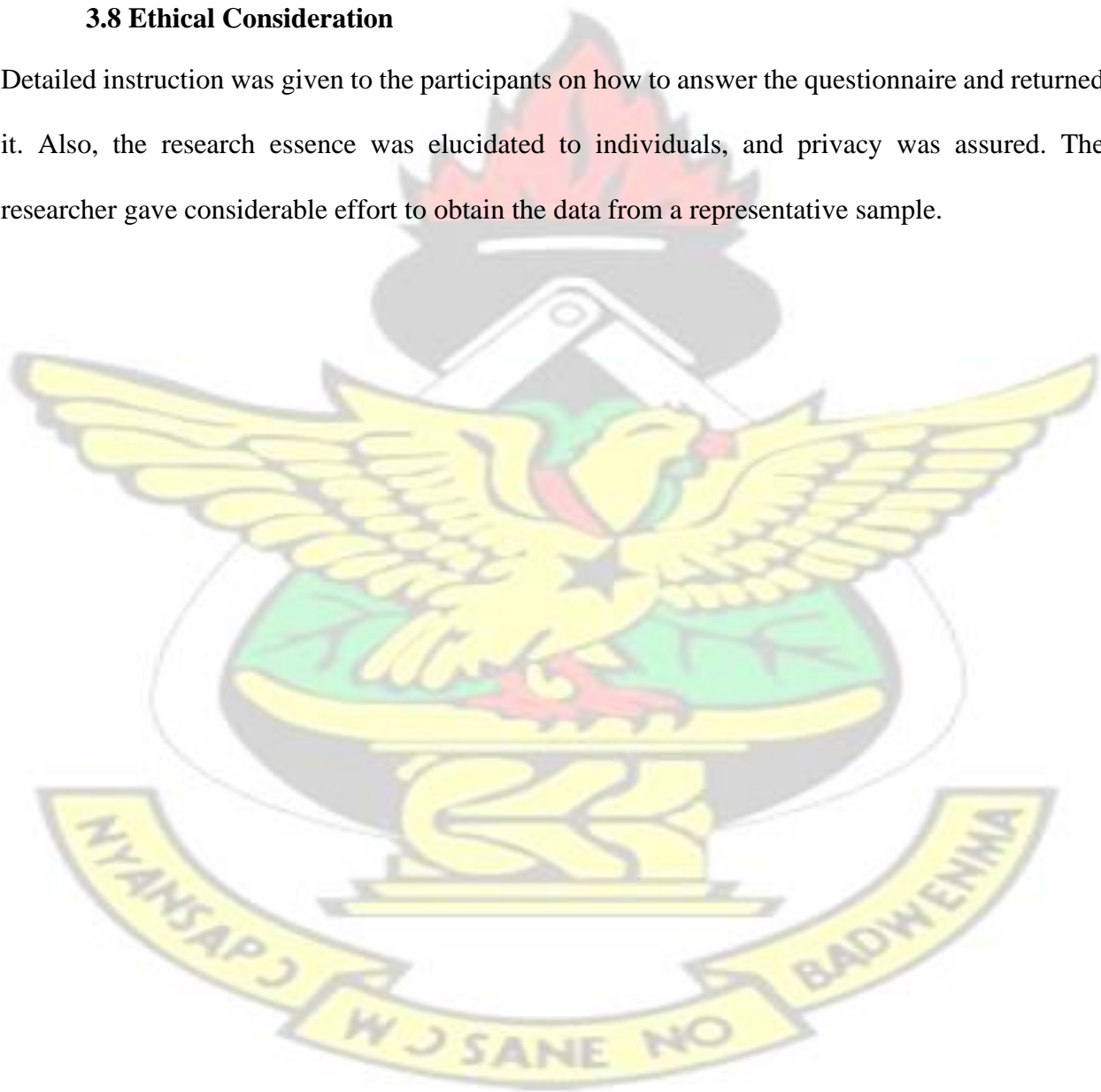
3.7.2 Reliability

Reliability refers to the consistency repeatedly reached and the consistency that is consistently achieved which is evidence of the instrument's stability and predictability in measuring the concept (Mohajan, 2017). This could also be considered as being the capacity to replicate a study or study results. In the view of Khalid et al. (2012), they termed reliability measurement as the extent to which a measurement is devoid of random error by producing a consistent result. To measure the reliability of the instruments, the study of Hair et al. (2012) which has proposed two

tests of reliability i.e. the internal consistency and indicator of reliability will be used. Composite Reliability test instead of Cronbach Alpha was used to prioritize the variables as per their reliability during model estimate (does not imply all variables are equally reliable), making it more appropriate for PLS-SEM. A Composite Reliability from 0.7 to 0.9 will indicate sufficient reliability of the measures.

3.8 Ethical Consideration

Detailed instruction was given to the participants on how to answer the questionnaire and returned it. Also, the research essence was elucidated to individuals, and privacy was assured. The researcher gave considerable effort to obtain the data from a representative sample.



CHAPTER FOUR

DATA ANALYSIS, PRESENTATION, AND DISCUSSION OF RESULT

4.1 Introduction

This chapter presents the results of the data analysis. The methods used were descriptive statistics, exploratory factor analysis, and confirmatory factor analysis. SmartPLS 4 was used for the hypothesis testing. The researcher delves further into the significance of the findings and makes connections to relevant studies in the discussion section.

4.2 Exploratory Factor Analysis

The study used exploratory factor analysis to apply certain fundamental controls to the collected data. Most often, SPSS was used to accomplish this goal. Separate factors contributing to non-response bias and common method bias are identified. Extensive studies were conducted, and their findings for this initial look at data quality are detailed in the research.

4.2.1 Test for Common Method Bias and Sampling Adequacy

One of the most often used techniques to identify common methods is Harman's single-factor test (Podsakoff et al., 2003). This test reveals whether or not there is a unique factor to which all variables load. This study is performed by doing an Exploratory Factor Analysis (EFA) using a single extraction factor instead of the usual three. As shown in the table 4.1, the variation was 72.334%, and the three retrieved components were responsible for it. In this case, there is no evidence of a common method bias since there was not a single component that emerged and the first factor explained 44.473% of the variation.

Results from a KMO sample adequacy are shown in Table 4.2. Data displays a KMO sample adequacy value of 0.913. This finding is in contrast to the zero and identity matrices by showing the high connection between values along this dimension. When dealing with a sufficiently small

sample, exploratory factor analysis may reliably give estimates. The data in table 4.2 are statistically significant when the p-value is less than 0.05. Insights drawn from the data point to causes other than random chance for the observed internal correlations between the variables. In order to gauge the underlying thought, most measurement methods have been vastly improved.

Table 4.1 Common Method Bias

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	5.951	44.473	44.473	5.951	44.473	44.473
2	2.408	19.829	64.302	2.408	19.829	64.302
3	1.044	8.032	72.334	1.044	8.032	72.334
4	0.645	4.961	77.295			
5	0.513	3.944	81.238			
6	0.42	3.232	84.47			
7	0.384	2.953	87.423			
8	0.36	2.768	90.192			
9	0.333	2.56	92.751			
10	0.31	2.384	95.135			
11	0.24	1.843	96.978			
12	0.215	1.652	98.63			
13	0.178	1.37	100			
Extraction Method: Principal Component Analysis.						

Table 4.2 KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.913
Bartlett's Test of Sphericity	Approx. Chi-Square	2404.747

df	78
Sig.	0.000

4.2.2 Non-Response Bias

An independent t-test was used to compare the means of the early and late respondents in an effort to rule out any potential effects of non-response bias in the data (Armstrong et al., 1977). A first response to a mailing was designated an "early response" (n = 146) in this study, whereas subsequent responses were categorized as "late responses" (n = 146) by the researcher. To check whether there was a discernible difference between the early and late responses, an independent t-test was run. There were no statistically significant differences between the early and late replies, as shown in Table 4.3. The p values for technological dynamism (p = 0.650), E-business proactiveness (p = 0.565) and procurement performance (p=0.080) were all above 0.05 (i.e., not significantly different) P values for technological dynamism, E-business proactivity, and procurement performance were all more than 0.05. (i.e., not significantly different). This finding informed the study's decision to combine both early and late response data into further studies of the proposed model.

Table 4.3 Non-Response Bias

Constructs	Group	Mean	Levene's Test for Equality of Variances		
			F	Sig.	T
Technological Dynamism	1.000	16.6154	0.207	0.650	1.620
	2.000	16.1049			
E-Business Proactiveness	1.000	20.8531	0.332	0.565	2.071
	2.000	20.049			
Procurement Performance	1.000	16.1469	3.085	0.080	1.055
	2.000	15.7552			

4.3 Demographic Information

The following table outlines the participants as well as the organisation with regard to their demographic information. The findings are summarised in the table 4.4 that can be seen below. From the result, 33.9% of the participants appeared to be females while 66.1% appeared to be males. The results also showed that 28.7% of the participants were around 18-30 years, 47.9% were around 31-40 years, 17.8% were around 41-50 years and 5.6% of the rest were above 50 years. From the results also, 34.2% of the participants had bachelor's degree, 24.1% had diploma, 8.7% master's/PhD, 12.9% had junior high school certificate, 0.3% hold other certificate and 19.6% of the remaining had senior high school certificate. The result again demonstrated that 26.9% of the participants were business owners, 47.2% were business owners and managers, 14.0% were managers, 10.8% were production managers and 1.0% hold other position. For the number of years their firms have been in operation, 33.2% of the participants indicated 1-5 years, 26.2% indicated 11-15 years, 7.7% indicated 16 years and above and 32.9 indicated 6-10 years. For the number of employees in their firms, 5.6% of the participants indicated 30-99 employees, 52.4% indicated 6-29 employees, 38.8% indicated more than 100 employees and 3.1% also indicated less than 5 employees. For the type of ownership of their company, 75.2% of the participants indicated fully-locally owned, 9.4% indicated fully-foreign owned and 15.4% also indicated jointly Ghanaian and foreign owned.

Table 4.4 Demographic Information

Variables	Frequency	Percent
<i>Gender</i>		
Female	97	33.9
Male	189	66.1
<i>Age</i>		
18 - 30 Years	82	28.7
31 - 40 Years	137	47.9

41 - 50 Years	51	17.8
Above 50 Years	16	5.6
<i>Level of Education</i>		
Bachelor Degree	98	34.2
Diploma	69	24.1
Graduate Studies (Master / Ph.D)	25	8.7
Junior High School	37	12.9
Others	1	0.3
Senior High School	56	19.6
<i>Your Position in the Firm</i>		
Business Owner	77	26.9
Business Owner & Manager	135	47.2
Manager	40	14.0
Production Manager	31	10.8
Other	3	1.0
<i>How many years have your firm been in operation</i>		
1-5 Years	95	33.2
11-15 Years	75	26.2
16 Years and Above	22	7.7
6-10 Years	94	32.9
<i>How many employees are in the firm?</i>		
30-99 employees	16	5.6
6-29 employees	150	52.4
Less than 5 employees	111	38.8
More than 100	9	3.1
<i>Type of ownership</i>		
Fully locally owned	215	75.2
Fully foreign owned	27	9.4
Jointly Ghanaian & foreign owned	44	15.4
Total	286	100.0

4.4 Measurement Model Assessment

Various measures of validity and reliability, including convergent validity, discriminant validity, and second-order concept validity, are examined by the researcher to guarantee accurate results. Cronbach's alpha (CA) values vary between 0.864-0.094, and the composite reliability (CA) for all constructs is in the same range (0.907-0.933). Table 4.5 displays the results, demonstrating that all constructs have enough internal consistency, above the threshold value of 0.70 (Nunnally,

1978). The estimates of both Cronbach's alpha and the composite reliability are highly indicative of reliability.

Average extracted variance (AVE) was introduced by Fornell and Larcker (1981) as a means of evaluating the convergent validity of a measurement model. All the AVE values for the various constructs may be found in the range of 0.671 to 0.777 in table 4.5. With this data, it is clear that the estimated AVEs are more than 0.50, the threshold suggested by Hair et al (1998). These results provide evidence that the measurement model's convergent validity was adequate.

Finally, discriminant validity of the measurement model is examined. To do this, Fornell and Larcker (1981), suggested looking at the correlations between the model's constructs in relation to the square root of the AVE for each construct. The diagonal components are the square roots of the AVEs, as shown in Table 4.6. The off-diagonal parts stand in for the relationships between the various construct. All diagonal elements are higher than their off-diagonal counterparts, proving that all constructs have sufficient discriminant validity.

Since the Fornell-Larcker criteria is not universally accepted, the HTMT ratio of correlations was devised as an alternative (Hair et al., 2019; Henseler et al., 2015; Voorhees et al., 2016). The vast majority of these studies have shown that HTMT values below 0.90 are optimal. To do this, one possible method is to deduct the average value of the items' correlations across constructs from the geometric mean of the average correlations for scales measuring the same variable (Henseler et al., 2015). The maximum HTMT is 0.760 which is far below 0.9 as shown in Table 4.7.

4.5 Description of the Data

SmartPLS begins with an abstract description of the data. This analysis is meant to provide the researcher with the extent to which the survey questions were answered by the respondents. Each criterion is given a numerical value in descriptive statistics (such as the mean, median, maximum,

standard deviation, excess kurtosis, and skewness, among others). Dispersion in data may be quantified statistically by looking at the standard deviation. The Means for the constructs are 4.09, 3.99 and 4.09 for e-business proactiveness, procurement performance, and technological dynamism respectively. Standard deviations are 0.804, 0.890, and 0.791 for e-business proactiveness, procurement performance, and technological dynamism respectively. These findings demonstrate that the calculated or statistical mean accurately reflects the true value of all variables.

Table 4.5 Reliability Validity and Descriptive Statistics

Confirmatory Factor Analysis Scale	Factor Loadings (t-values)	Descriptive Statistics Mean	SD	VIF
<i>E-Business Proactiveness (CA=0.877; CR=0.911; AVE=0.671)</i>				
EBP1	0.783(17.699)	4.157	0.784	2.026
EBP2	0.807(18.223)	4.119	0.78	2.057
EBP3	0.844(23.655)	4.017	0.834	2.576
EBP4	0.835(24.562)	4.112	0.799	2.243
EBP5	0.826(22.064)	4.045	0.824	2.688
<i>Procurement Performance (CA=0.904; CR=0.933; AVE=0.777)</i>				
PP1	0.848(18.594)	3.857	0.937	2.1703
PP2	0.897(22.653)	3.986	0.873	1.3166
PP3	0.892(23.476)	4.066	0.873	2.7744
PP4	0.888(22.784)	4.042	0.876	3.1574
<i>Technological Dynamism (CA=0.864; CR=0.907; AVE=0.709)</i>				
TD1	0.846(21.599)	3.962	0.854	2.1151
TD2	0.857(21.225)	4.077	0.767	2.0644
TD3	0.852(20.071)	4.15	0.781	2.0967
TD4	0.814(17.700)	4.171	0.763	1.9067

Table 4.6 Fornell-Larcker test

Constructs	1	2	3
E-Business Proactiveness	0.819		
Procurement Performance	0.638	0.882	
Technological Dynamism	0.666	0.552	0.842

Table 4.7 HTMT Test results

Constructs	1	2	3
E-Business Proactiveness			
Procurement Performance	0.716		
Technological Dynamism	0.760	0.620	

4.6 Model Fit Summary

Possible appropriate values and ranges are provided for the Fitness of Extracted-Index, SRMR, Root Mean Square of Approximation, and Chi-Square (Table 4.8). Both the rare and extracted indices are below the permitted 0.9. If the residual has a square root or common root, then it is not infinitely insignificant since it has a finite value. As a result, it will be essential for future research to take into consideration all relevant data and points of view.

Table 4.8 Fit Summary

Indices	Saturated model	Estimated model
SRMR	0.061	0.061
d_ULS	0.334	0.334
d_G	0.181	0.181
Chi-square	318.322	318.322
NFI	0.870	0.870

4.7 Coefficient of Determination and Predictive Power of the PLs Model

First, the researcher verified the measurement model, and then evaluated the validity of the underlying structural model and the expected relationships. By testing for collinearity before evaluating the structural relationships, the study avoids the possibility of false positives. Therefore, VIF was calculated for the hidden factors. It was found in table 4.5 that VIF values ranged from 1.317 to 2.687, which is much less than the minimum requirement of 3.3. (Hair et al., 2019). Several researchers have examined the R2 values of the endogenous variables to determine how well the model represented the sample data. Between 0.75 and 0.50, the R2 value indicates a strong

and moderate association, whereas below 0.25 indicates a weak one (Hair et al., 2011). Table 4.9 and Figure 4.1 show R² values of 0.443 and 0.436, respectively, for e-business proactiveness and procurement performance. Both of these values have a higher explanatory power.

The predictive power of the PLS path model may also be evaluated concerning Q² (Geisser, 1974; Stone, 1974). When Q² achieves a certain threshold of significance, an in-house data-dependent structural model may be deemed predictive (Hair et al., 2019). Table 4.9 displays the predictive performance of the model, with Q² scores of 0.434 and 0.295 for e-business proactiveness and procurement performance respectively.

Table 4.9 Coefficient of Determination and Predictive Power of the PLs Model

Endogenous Constructs	R-square	Q ² predict
E-Business Proactiveness	0.443	0.434
Procurement Performance	0.436	0.295

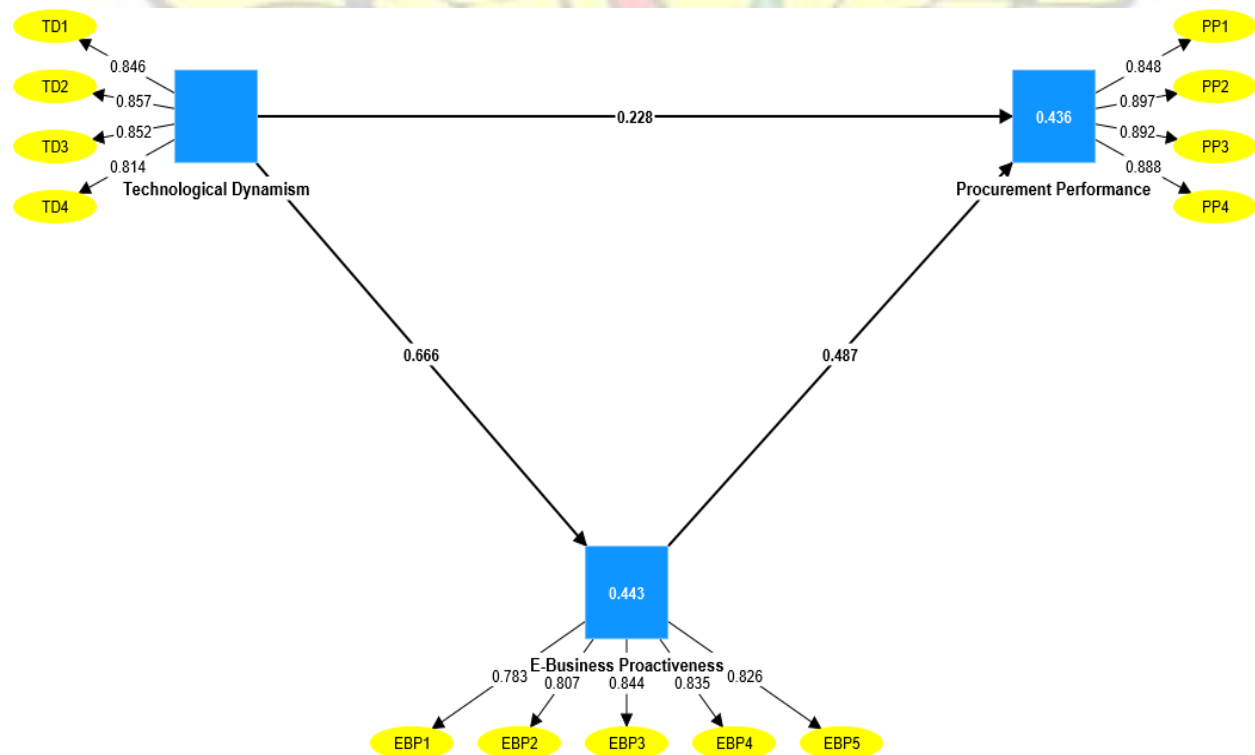


Figure 4.1 Measurement Model Assessment

4.8 Hypotheses for Direct and Indirect Relationship

The four assumptions put out for the study were put to the test using smartPLS 4. The primary purpose of this research is to examine the mediating function of e-business proactiveness between technological dynamism and procurement performance in the Ghanaian public sector. As a result of the problems highlighted in the problem description, three distinct aims were proposed. This data is summarised in table 4.10, and figure 4.2 is shown below.

The first goal of this research was to analyse how technological dynamism affect public sector procurement performance in the Ghanaian public sector. In Table 4.10 and figure 4.1 technological dynamism correlates positively with the performance of public sector procurement in Ghana ($B=0.228$; $t=0.3.430$; $p\text{-value}=0.001 < 0.05$). The results of this study provide credence to the researcher's hypothesis that a link exists between the factors under investigation. It also revealed that variability in the procurement performance of the Ghanaian public sector may be accounted for by the degree to which technological dynamism is handled (22.8 %) (assuming all other variables are equal). The research suggests that if public sector leaders in Ghana placed a greater emphasis on technological dynamism, public sector procurement performance in Ghana might improve in a way that is both equitable and long-lasting.

The research also delved into how the Ghanaian public sector attitude toward technological dynamism and e-business proactiveness is connected. Table 4.10 and Figure 4.2 show that the sector's proactivity in e-business is significantly affected by their ability to embrace technological dynamism ($B=0.666$; $t=16.081$; $p\text{-value}=0.000 < 0.05$). This study's results provide credence to the assumption that two factors are related. Assuming no other independent variables changed, the results show that a one-unit change in technical dynamism accounts for 66.6% of the

change in e-business proactiveness. If government officials are serious about improving e-business proactivity, they should promote their experience in fostering technological dynamism.

The second goal of the research was to ascertain whether the public sector's ability to enhance procurement performance had been impacted by the increasing prevalence of e-business proactiveness. Table 4.10 and figure 4.2 show a positive and statistically significant relationship between public sector e-business proactiveness and procurement performance ($B=0.487$; $t=7.400$; $p\text{-value}=0.000 < 0.05$). Results show that a link exists between the two hypotheses examined. This provides more evidence that the Ghanaian government's evolving support for e-business proactiveness may be related to larger shifts in the performance of their procurement operations. As a result, this explains 48.7% of the variability in performance gains from procurement. These findings suggest that proactivity in e-business in the public industry is advantageous to management.

The third aim of the research was to ascertain whether or not e-business proactiveness mediates the relationship between technological dynamism and public sector procurement performance. Table 4.10 and Figure 4.2 show that the proactiveness of e-businesses plays a significant mediating role between technological dynamism and procurement performance ($B=0.324$; $t=6.440$; $p\text{-value}=0.000 < 0.05$). This study's results provide support to the proposed link between the variables, which was predicted to be the case. Furthermore, the results show that e-business proactivity may account a correlation between technological dynamism and procurement performance (32.4%). (After controlling for other factors). The results of this research stress the need of senior-level attention to e-business proactiveness within public sector organizations for maximizing the positive impact of technological dynamism on procurement performance.

Table 4.10 Hypotheses for Direct and Indirect Relationship

Hypotheses	Original sample (O)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values	Decision
Technological Dynamism -> Procurement Performance	0.228	0.066	3.430	0.001	Supported
Technological Dynamism -> E-Business Proactiveness	0.666	0.041	16.081	0.000	Supported
E-Business Proactiveness -> Procurement Performance	0.487	0.066	7.400	0.000	Supported
Technological Dynamism -> E-Business Proactiveness -> Procurement Performance	0.324	0.050	6.440	0.000	Supported

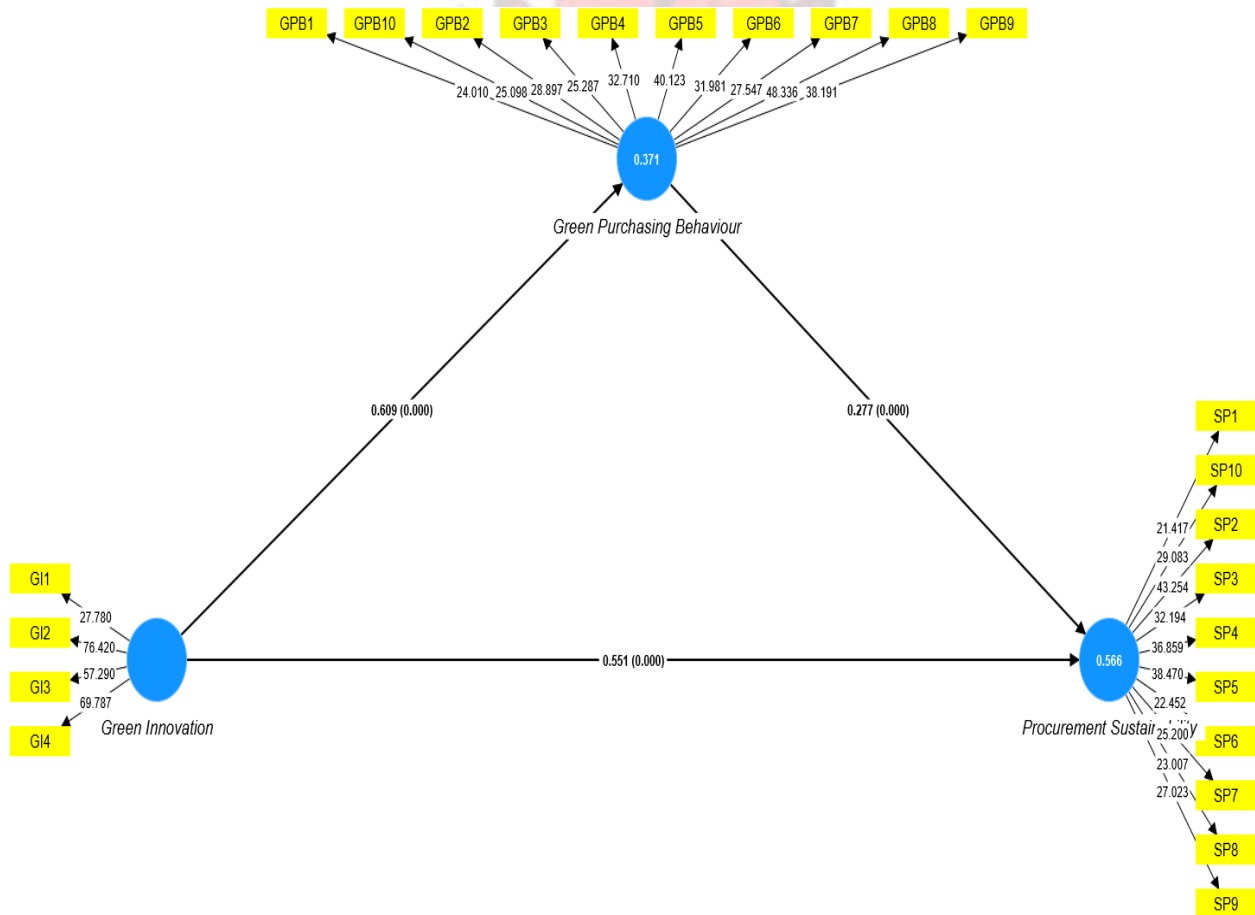


Figure 4.2 Structure Model Evaluation

4.9 Discussion of Key Result

An overview of the relevant literature is presented here, with an emphasis on the most important results from the study. The primary purpose of this research is to examine the mediating function of e-business proactiveness between technological dynamism and procurement performance in the Ghanaian public sector. As a result of the problems highlighted in the problem description, three distinct aims were proposed. The results may be broken down into the categories laid forth below.

The first goal of this research was to analyse how technological dynamism affect public sector procurement performance in Ghanaian public sector. The findings indicated that technological dynamism correlates positively with the performance of public sector procurement in Ghana ($B=0.228$; $t=0.3.430$; $p\text{-value}=0.001 < 0.05$). The results of this study provide credence to the researcher's hypothesis that a link exists between the factors under investigation. It also reveals that variability in the procurement performance of the Ghanaian public sector may be accounted for by the degree to which technological dynamism is handled (22.8 %) (assuming all other variables are equal). The research suggests that if public sector leaders in Ghana place a greater emphasis on technological dynamism, public sector procurement performance in Ghana might improve in a way that is both equitable and long-lasting. This finding is consistent with the knowledge-based view theory's assumption that a company's information and knowledge are its most valuable strategic assets (Grant, and Phene, 2022). The results corroborate the work of Lin et al. (2019), who studied the impact of technological dynamism on the success of Russian businesses and the role that ownership had in that success. The results indicated that the success of Russian businesses is driven by the use of IT, an entrepreneurial mindset, and technological instability. The findings corroborate the findings of Cheptora et al. (2018), who examined the impact of IT on procurement performance and found that IT enhances performance.

The second goal of the research was to ascertain whether the public sector's ability to enhance procurement performance had been impacted by the increasing prevalence of e-business proactiveness. The results showed a positive and statistically significant relationship between public sector e-business proactiveness and procurement performance ($B=0.487$; $t=7.400$; $p\text{-value}=0.000 < 0.05$). Results showed that a link exists between the two hypotheses examined. This provides more evidence that the Ghanaian government's evolving support for e-business proactiveness may be related to larger shifts in the performance of their procurement operations. As a result, this explains 48.7% of the variability in performance gains from procurement. These findings suggest that proactivity in e-business in the public industry is advantageous to management. These findings are consistent with those of Innocent et al. (2016), who looked into the causes and impacts of e-business adoption in New Artel, Rwanda. Results showed that New Artel, Rwanda's procurement performance improved when the company adopted e-business practices. The results are consistent with those found by Adzroe et al. (2018), who look at how e-business technology might improve construction purchasing. The research indicates that small and micro businesses in the construction industry in Ghana benefit from the use of e-business technologies. The findings reinforce research conducted by Chinomona and Bikissa-Macongue (2021) in southern Gauteng that looked at the relationship between supplier in e-businesses, information sharing, and information quality, and the collaboration of e-businesses' customers. Factors of consumer e-business cooperation were identified, including supplier e-business interaction, knowledge transfer, and system quality.

The third aim of the research was to ascertain whether or not e-business proactiveness mediates the relationship between technological dynamism and public sector procurement performance. The findings indicated that the proactiveness of e-businesses plays a significant mediating role

between technological dynamism and procurement performance ($B=0.324$; $t=6.440$; $p\text{-value}=0.000 < 0.05$). This study's results provide support to the proposed link between the variables, which was predicted to be the case. Furthermore, the results show that e-business proactivity may account a correlation between technological dynamism and procurement performance (32.4%). (After controlling for other factors). The results of this research stress the need of senior-level attention to e-business proactiveness within public sector organizations for maximising the positive impact of technological dynamism on procurement performance. These findings corroborate the work of Hussain et al. (2020), who investigated the role of e-commerce as a mediator between organizational and environmental factors and the performance of small and medium-sized enterprises (SMEs). The findings suggest that the link between managerial support and market competition may be mediated via direct e-commerce. The results corroborate those of Ardiansah et al. (2019), who found that e-commerce acts as a mediator between the company and its customers' perceptions of the company's performance.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes the study with a brief discussion of the study's findings and recommendations for further inquiry. The study's limitations as well as some suggestions for further research are discussed.

5.2 summary

The primary purpose of this research is to examine the mediating function of e-business proactiveness between technological dynamism and procurement performance in the Ghanaian public sector. As a result of the problems highlighted in the problem description, three distinct aims were proposed. Following this, the study provides a concise summary of the study's primary conclusions, which were drawn from the results of the research and the previously published literature. According to the stated goals of the study, the results are presented in a logical progression.

5.2.1 The Impact of Technological Dynamism on Procurement Performance

The first goal of this research was to analyse how technological dynamism affect public sector procurement performance in Ghanaian public sector. The findings indicated that technological dynamism correlates positively with the performance of public sector procurement in Ghana. The results of this study provide credence to the researcher's hypothesis that a link exists between the factors under investigation. It also reveals that variability in the procurement performance of the Ghanaian public sector may be accounted for by the degree to which technological dynamism is handled. The research suggests that if public sector leaders in Ghana place a greater emphasis on technological dynamism, public sector procurement performance in Ghana might improve in a way that is both equitable and long-lasting.

By facilitating the collection and analysis of useful data, the enforcement of policy, the tracking of expenditure for improved visibility, and the acceleration of operational performance, technology is proving to be a benefit to a wide variety of procurement and supply chain tasks. Automation of warehouse processes, expedited delivery, proactive inventory management, optimized strategic sourcing partnerships, and innovative customer experiences are all possible due to the application of artificial intelligence (AI), machine learning (ML), and predictive analytics (PA). Once a company's competitive edge has been determined, procurement and supply chain professionals may more easily attach cost drivers to the value offer, allowing them to cut out inefficient procedures with the use of technology.

5.2.2 The Impact of E-business on Procurement Performance

The second goal of the research was to ascertain whether the public sector's ability to enhance procurement performance had been impacted by the increasing prevalence of e-business proactiveness. The results showed a positive and statistically significant relationship between public sector e-business proactiveness and procurement performance. Results showed that a link exists between the two hypotheses examined. This provides more evidence that the Ghanaian government's evolving support for e-business proactiveness may be related to larger shifts in the performance of their procurement operations. As a result, this explains the variability in performance gains from procurement. These findings suggest that proactivity in e-business in the public industry is advantageous to management.

With an e-Procurement system, customers have more leeway and say in every step of the buying process. Modern e-Procurement systems are built on the principle of control, which is manifested at every stage of the ordering process, from the entry of the order through its approval, purchase, and subsequent receipt and payment. By offering standardization, simplification, and integration of procedures, e-procurement technologies improve the value for money of public procurement

and lead to more effective use of public funds. E-procurement is a method of streamlining the procurement process, management, and strategy by consolidating and automating the communication between all involved parties (end users, procurement department, suppliers, etc.).

5.2.2 The mediating role E-business Proactiveness in the relationship between Technological Dynamism and Procurement Performance

The third aim of the research was to ascertain whether or not e-business proactiveness mediates the relationship between technological dynamism and public sector procurement performance. The findings indicated that the proactiveness of e-businesses plays a significant mediating role between technological dynamism and procurement performance. This study's results provide support to the proposed link between the variables, which was predicted to be the case. Furthermore, the results showed that e-business proactivity may account a correlation between technological dynamism and procurement performance. The results of this research stress the need of senior-level attention to e-business proactiveness within public sector organizations for maximising the positive impact of technological dynamism on procurement performance.

If used effectively, e-commerce has the ability to further cut down on transaction costs while also bringing savings and efficiency to service delivery. Investment in IT infrastructure, training for new skills, and a change in organizational culture are all up-front expenses. Retailers and their consumers both benefit from the efficiency of online shopping. Retailers attract a more diverse clientele, and consumers have access to a broader selection of items. Although convenient, e-commerce has its flaws, and consumers may have to wait longer than they would in a brick-and-mortar shop to acquire their goods.

5.3 Conclusion

This study's overarching goal is to analyse how technological dynamism affects public sector procurement performance in Ghana by way of e-business proactiveness as a mediator variable. Three separate goals were offered as response to the issues outlined in the problem statement. The study used deductive reasoning for the quantitative data and a cross-sectional descriptive survey approach. The sample procedures, the development of research equipment, and the analysis were all informed by a quantitative approach to the study. The hypotheses in this research were grounded on the preexisting RBV and PAT. Procurement officers, retail managers, warehouse managers, and members of entity tender committees made up the study's population of senior managers. A total of 286 staff members with extensive experience with the phenomenon under investigation participated in the survey. Managers from Ghana's public sector firms were selected using a purposive sample strategy for this research. Structural Equation Modeling (SmartPLS 4) was used to verify the study's assumptions. In the research, descriptive statistics were used to summarize the collected data. The results showed that technological dynamism has a significant effect on the performance of public sector procurement. Proactivity in e-business was also shown to have a significant impact on procurement performance, acting as a mediator between technological dynamism and the procurement performance. According to the findings, public sector managers may boost procurement performance by fostering technology dynamism and e-business proactiveness.

5.4 Recommendation

This study's overarching goal is to analyse how technological dynamism affects public sector procurement performance in Ghana by way of e-business proactiveness as a mediator variable. The results showed that technological dynamism has a significant effect on the performance of public sector procurement. Proactivity in e-business was also shown to have a significant impact

on procurement performance, acting as a mediator between technological dynamism and the procurement performance. According to the findings, public sector managers may boost procurement performance by fostering technology dynamism and e-business proactiveness. These observations informed the following suggestions.

- Evidence from the public sector in Ghana indicates that technical dynamism has a significant effect on procurement performance. If these results are to be believed, then all that is required to boost the efficiency of procurement across industries is a greater emphasis on technological dynamism. As a result, it is crucial for the leadership of public sector enterprises to create a long-term technology strategy, choose their preferred technology-related media channels, and invest in the internet of things, information technology, and other related technologies.
- Given the information provided, it seems to presume that more proactive use of e-business would lead to better procurement performance. Managers in the public sector are tasked with promoting proactivity in e-business through means such as improved product segmentation, highlighting innovative brands, offering more financing options, offering discounts, leveraging social evidence, building rewards programs, and offering discounted or free shipments.
- According to the findings, the dynamic relationship between technology and procurement was mediated by the proactiveness of e-business. E-business proactiveness has a greater effect on procurement performance when it is prioritised by management at public sector firms. Leaders in the public sector should also emphasize the importance of utilizing novel e-business solutions, conducting an influencer marketing campaign, producing interesting content, participating in an internet group, and using high-quality imagery.

5.5 Limitations and Future Research Direction

This study has made every effort to be thorough in its research design, as well as objective and transparent in its data collecting and analysis. However, it has been constrained by factors such as time, resources, the cooperation of relevant persons, and funding. Consequently, there are constraints on how far the researcher can generalise these findings, and the research itself will include flaws that are difficult to avoid. There are a few limitations to this research. This study's data was gleaned from participants' subjective questionnaire replies. The research only collected 286 samples in total since so few participants from the public sectors were selected to take part. Consequently, some respondents' subjective awareness may contribute measurement bias. Furthermore, all construct measurements were gathered by manager self-report, which might enhance the possibility of common method bias. Whether or if the findings presented here are sensitive to the choice of informant may be clarified by future studies that use upper- or middle-level managers as sources. Because of the limitations of time, this study used a cross-sectional research design, in which data were gathered all at once, in a single instant in time. Consequently, it is not possible to monitor the development of the study design over time, in contrast to the longitudinal research method. It is thus suggested that future research collect longitudinal data and at many time periods to strengthen the results of causal conclusions. In addition, the study's results may not generalise to other fields since they were conducted just in one. Additional research is required to determine the applicability of these results to other areas of study.

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APPENDIX

SURVEY QUESTIONNAIRE

Dear Sir/ Madam,

My name is, a postgraduate student at the Kwame Nkrumah University of Science and Technology, Kumasi, Department of Supply Chain and Information Systems. This survey instrument has been designed to enable me carry out research on the topic: **“Effect of Technological Dynamism on Procurement Performance; the mediating role of E-Business Proactiveness”**. Any information provided will be used for academic purposes ONLY. There are no risks associated with your participation, and your responses will remain confidential and anonymous.

SECTION A: RESPONDENT’S BIOGRAPHY AND COMPANY PROFILE

When completing this questionnaire, please tick [☐] in the applicable box or provide an answer as applicable.

Please answer the following questions:

1. *Gender:* Male ☐ Female ☐
2. *Age*
18-30 years ☐ 31-40 year’s ☐ 41-50 years ☐ Above 50 years ☐
3. *Level of Education*
Junior High School ☐ Senior High School ☐ Diploma ☐ Bachelor Degree ☐
☐ Graduate Studies (Master / Ph.D.) ☐ Others ☐ For Others, Please specify:.....
4. *Your Position in the Firm*
Business Owner ☐ Business Owner & Manager ☐ Manager ☐ Production Manager ☐
☐ Others ☐.....
5. *How many years have your firm been in operation?*
1 - 5 years ☐ 6 - 10 years ☐ 11 – 15 years ☐ 16 years and above ☐
6. *How many employees are in the firm?*
Less than 5 employees ☐ 5 – 29 employees ☐ 30 – 99employees ☐ More than 100 ☐
7. *Type of ownership:*
[☐] Fully locally owned [☐] Fully foreign owned [☐] Jointly Ghanaian & foreign owned

SECTION B: TECHNOLOGICAL DYNAMISM (Cruz-González et al., 2015).

Please, indicate the degree in which the following statements describe your firm's main competitive environment during the last three years 2019 to 2022: using the scale 1 to 5: Not at all – A very great extent

Item	Statement	1	2	3	4	5
TD1	The technology is changing rapidly.					
TD2	It is very difficult to forecast where the technologies will be in the next 5 years					
TD3	Technological changes provide big opportunities					
TD4	A large number of new products have been made possible through technological breakthroughs					

SECTION B: E-BUSINESS PROACTIVENESS (Al-Omoush et al., 2020)

To what extent do the following statements apply to your company in responding to the COVID-19 pandemic: using the scale 1 to 5: Not at all – A very great extent

Item	Statement	1	2	3	4	5
EBP1	Introducing new IT applications in responding to the effects of the COVID-19 crisis					
EBP2	Reinforcing the activities of exploiting innovative e-business solutions in responding to the COVID-19 crisis					
EBP3	Endeavouring to adopt new e-business applications during the COVID-19 crisis					
EBP4	Being at the forefront of discovering emerging e-business opportunities to address restrictions imposed by the coronavirus pandemic					
EBP5	Pioneering the adoption of new e-business solutions in responding to business challenges posed by COVID-19					

SECTION C: Procurement Performance

In this section, we are trying to measure the **Procurement Performance**. Please indicate the degree of your agreement with the following statements. Using the Likert scale, where 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree

Procurement Performance	1	2	3	4	5
Our organisation has delivery at the right time					
Our organisation has delivery at the right quantity					
Our organisation has delivery at the right price.					

Our organisation has delivery at the right quality					
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Thank you for participating in the survey.

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