

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

MEDIATION EFFECT OF PROCUREMENT PLANNING ON THE RELATIONSHIP
BETWEEN INFORMATION TECHNOLOGIES AND PROCUREMENT
PERFORMANCE IN MANUFACTURING FIRMS: CASE STUDY OF
MANUFACTURING FIRMS IN GHANA.

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MSc. PROCUREMENT AND SUPPLY CHAIN MANAGEMENT

A thesis submitted to the Department of Supply Chain and Information Systems,
Kwame Nkrumah University of Science and Technology, Institute of Distance Learning, in
Partial Fulfillment of the Requirements for the Award of the degree of

**MASTER OF SCIENCE IN
PROCUREMENT AND SUPPLY CHAIN MANAGEMENT**

June, 2023.

DECLARATION

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

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DEDICATION

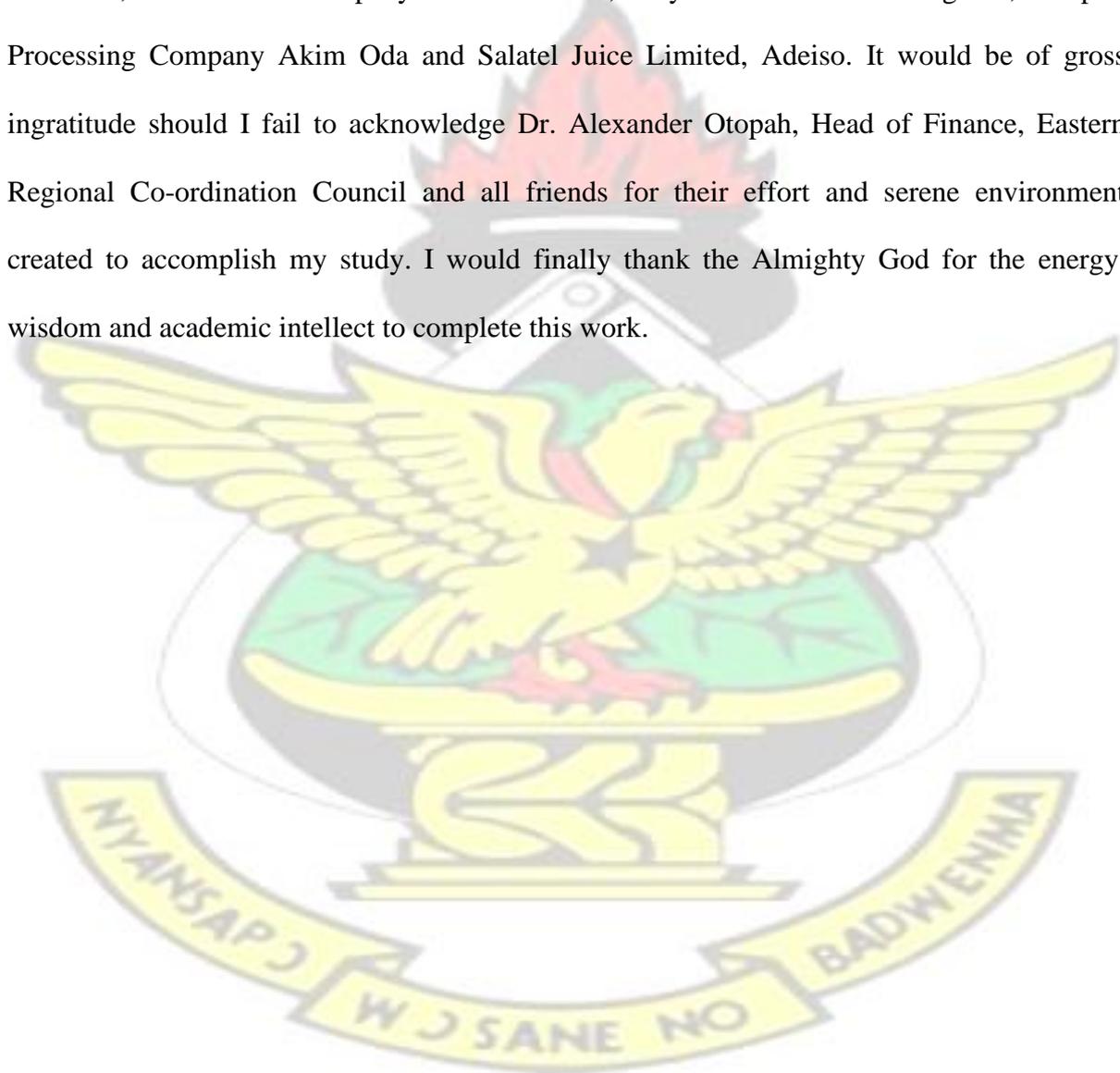
I dedicate this work to the almighty God, my wife Mrs. Leticia Oman Fosu, my children Nancy Akua Fosua, Ahemah Freda Fosua and Ofosuhene Yaw. Also to my dear parent Prophet Charles Duke Fosu and Maame Afua Ahemah.



ACKNOWLEDGEMENT

Writing this dissertation was one of the most significant academic challenges. I thank the almighty God for His guidance and protection throughout the undertaken of this thesis. My deepest appreciation goes to my supervisor Dr. John Mensah for his constructive directives that helped me stay focus to this work, especially his patience towards me.

I extend my deepest gratitude to all the manufacturing companies I visited, Ghacem Takorade, Mana Link Company Limited Accra, Stay Alive Manufacturing Ho, Coopon Processing Company Akim Oda and Salatel Juice Limited, Adeiso. It would be of gross ingratitude should I fail to acknowledge Dr. Alexander Otopah, Head of Finance, Eastern Regional Co-ordination Council and all friends for their effort and serene environment created to accomplish my study. I would finally thank the Almighty God for the energy, wisdom and academic intellect to complete this work.



ABSTRACT

This study investigates the impact of information technology on procurement management in Ghanaian manufacturing enterprises. This research employs a quantitative-descriptive approach to investigate the intricate dynamics of public procurement effectiveness. Quantitative-descriptive approach to investigate the intricate dynamics of public procurement performance and planning. The study adopted purposive and convenience sampling to sample 150 respondents from supply chain and procurement roles is chosen. SPSS version 27 and Andrews-Hayes Process Macro module 4.0 facilitated the descriptive, reliability, correlations, regression and mediation analysis. The study found out that information technology had a significant and positive influence on procurement performance (Beta = 0.653, $P < 0.05$). Information technology had a significant and positive influence on procurement planning (Beta = 0.700, $P < 0.05$). Procurement planning significantly and positively influence procurement performance (Beta = 0.838, $P < 0.05$). Procurement planning mediated the relationship between information technology and procurement performance. It is recommended that organizations prioritize the strategic integration of information technology and efficient procurement planning processes.

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LIST OF ABBREVIATION

IT-Information Technology

RBV- Resource-Based View

ERP- Enterprise Resource Planning

TCT- Transaction Cost Theory

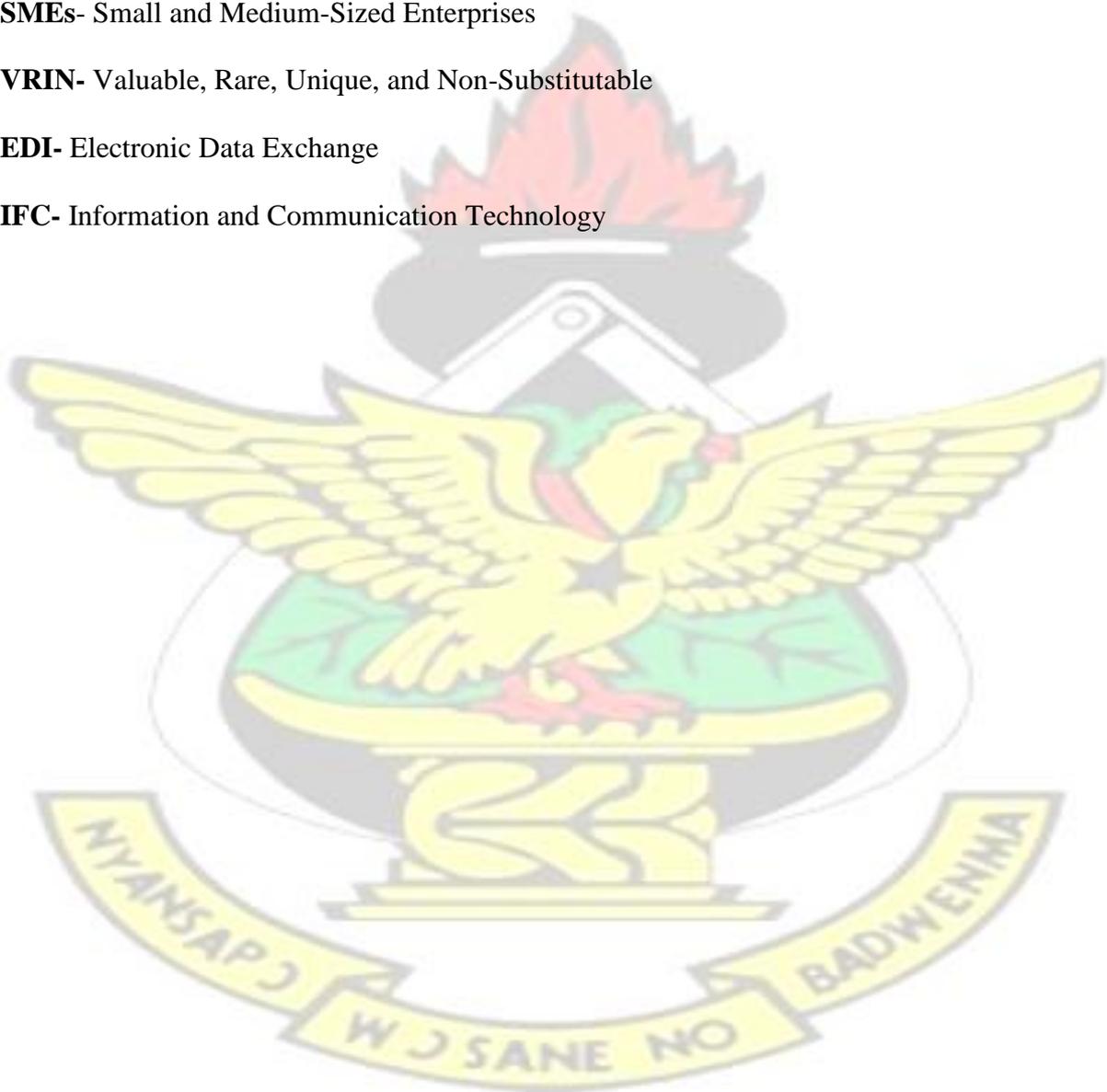
SPSS-Statistical Package for Social Science

SMEs- Small and Medium-Sized Enterprises

VRIN- Valuable, Rare, Unique, and Non-Substitutable

EDI- Electronic Data Exchange

IFC- Information and Communication Technology



CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

In contemporary times marked by globalization and heightened competition in the manufacturing sector, companies are consistently exploring novel approaches to augment their overall operational efficiency (Taouab & Issor, 2019). According to numerous academic sources (Kiragu, 2012; Carr and Smeltzer, 2002; Dixit, Gupta, and Narain, 2009; and Afolabi et al., 2022). In this regard, a notable development is the incorporation of information technology (IT) into the procurement process. The results of Foerstl et al. (2013) indicate that there is support in scholarly research that information technology (IT) has an immediate and beneficial effect on procurement performance. The correlation between information technology (IT) and procurement efficiency, transparency, and cost reduction has been acknowledged in scholarly literature (Kumar and Ganguly, 2021). Information technology is a crucial factor in procurement as it enables automation, decreases cycle times, enhances decision-making, and improves supplier relationships (Rejeb, Sle, and G. Keogh, 2018). The integration of IT tools, including e-procurement systems, ERP systems, and other digital platforms, has become a fundamental aspect of contemporary procurement procedures (Faccia and Petratos, 2021). According to Rejeb, Sle, and Keogh (2018), the utilization of such tools facilitates the optimization of procurement operations within organizations, leading to cost reduction, enhanced visibility, and improved control over procurement processes.

The literature has extensively documented the beneficial effects of information technology (IT) on procurement performance. Croom and Brandon-Jones' (2007) research found that the implementation of e-procurement systems significantly improved procurement performance in a number of areas, including cost, quality, and delivery. Additionally, Schoenherr and Speier-Pero (2015) assert that improved data analysis and reporting capabilities of information technology (IT) enhance procurement decision-making. The utilization of real-time data empowers procurement managers to make well-informed decisions, resulting in improved negotiation outcomes and supplier selection. The utilization of information technology (IT) has been found to have a positive impact on communication and collaboration with suppliers, leading to an improvement in supplier relationships and performance (Prahinski and Benton, 2004).

Nevertheless, the nature of this association is not as unambiguous as it initially seems. Numerous academics posit that the advantages of implementing information technology in procurement are reliant on specific intermediary elements (Croom and Brandon-Jones, 2007; Pavlou and Fygenson, 2006; and Marshall et al., 2019). Dey et al. (2015) suggest that procurement planning, which involves a methodical process of identifying requirements, selecting suppliers, negotiating contracts, and evaluating performance, serves as a mediating factor. The RBV provides additional evidence for the mediating impact of procurement planning. The Resource-Based View (RBV) theory, according to Ramkumar et al. (2019), asserts that the proper management and taking advantage of these resources is a prerequisite for the successful use of information technology (IT) in procurement. The process of effectively managing and exploiting IT resources necessitates the implementation of procurement planning as a crucial component.

Although procurement planning has a solid theoretical foundation and empirical evidence supporting its mediation effect, there remains a dearth of comprehensive understanding regarding this concept. The majority of prior research has concentrated on investigating the direct correlation between information technology (IT) and procurement performance while giving minimal consideration to the intermediary function of procurement planning (Rai et al., 2012; Davila et al., 2012). Furthermore, it is noteworthy that the impact of procurement planning on organizational performance may exhibit heterogeneity contingent on firm-specific attributes and the nature of the information technology implemented. The planning procedures for the implementation of intricate IT systems, such as enterprise resource planning (ERP), may differ from those of uncomplicated IT tools, as suggested by scholarly sources (Leu and Lee, 2017; Shen, Chen, and Wang, 2016). The present research endeavors to narrow this divide by examining the mediating influence of procurement planning on the correlation between information technology (IT) and procurement performance within manufacturing enterprises.

1.2 Statement of the Problem

The role of information technology (IT) in improving procurement performance has been extensively recognised in both academic and corporate sectors over the past decade (Topi et al., 2010; De Vries and Huijsman, 2011). According to Tai, Ho, and Wu (2010), there is a theory that information technology (IT) deployment may enhance procurement performance by optimising processes, lowering transaction costs, and improving transparency and efficiency. Despite the extensive use of IT in procurement, researchers have discovered that the promised advantages are not always realized (Nani and Ali, 2020; Marshall et al., 2019). This matter merits additional investigation. Furthermore, the impact of information technology (IT) on procurement performance tends to vary among contexts. According to

Schwalbe's (2015) study, there is evidence that the influence of IT is greater in bigger organisations than in smaller ones. According to Ivanov, Dolgui, and Sokolov (2019), the effectiveness of IT in increasing procurement performance may be determined by the industry category, procurement process features, and regulatory framework. The current literature provides limited viewpoints on the contextual aspects under consideration. The current study is to explore the impact of information technology on procurement effectiveness in the industrial sector.

Furthermore, Mose, Njihia, and Magutu (2013) observed an increasing tendency in the industrial industry towards the integration of information technology (IT) to improve procurement performance. According to academic sources (Rai, Patnayakuni, & Patnayakuni, 2012; Khan et al., 2021), information technology (IT) installation is expected to optimise procurement methods, reduce expenditures, and increase effectiveness, leading in improved procurement performance. Nonetheless, the desired outcomes are not always achieved. Several research studies have shown that just using information technology (IT) does not guarantee improved procurement performance (Wu, Zsidisin, and Ross, 2007). Dey et al. (2015) and Ramkumar et al. (2019) claim that there is a dearth of information in the body of current research about the intermediary role of procurement planning in the relationship between IT adoption and procurement performance within manufacturing firms. As is apparent by the studies of Rodriguez-Escobar and Gonzalez-Benito (2015) and Cheptora, Osoro, and Musau (2018), earlier research has examined the direct influence of information technology (IT) on procurement performance. The research on how IT indirectly affects procurement performance via procurement planning is, however, lacking. The mediating role of procurement planning is crucial in industrial organisations due to the complex nature of procurement activities that need strategic planning (Corboş, Bunea, & Jiroveanu, 2023).

According to Transaction Cost Theory (TCT), efficient integration of information technology (IT) in procurement may result in lower transaction costs and increased efficiency. However, according to Christensen and Karlsson (2019), this outcome is contingent on effective procurement activity planning. In the field of IT adoption, little attention has been paid to the analysis of the relationship between procurement planning, transaction costs, and procurement performance. The current study seeks to address the aforementioned gaps by investigating the function of procurement planning as a moderator in the relationship between information technology (IT) and procurement performance in manufacturing businesses. In order to attain this objective, the research uses the instance of Ghacem Takoradi.

1.3 Objectives of the Study

The study's primary goal is to examine the impact of information technology on procurement management in Ghanaian manufacturing enterprises. The following goals were especially addressed in the study:

1. To investigate the impact of information technology on procurement performance in manufacturing companies.
2. To investigate the influence of information technology on procurement planning in manufacturing companies.
3. To examine at the effect of procurement planning on procurement performance in manufacturing companies.
4. To evaluate the role of procurement planning in mediating the link between information technology and procurement performance in manufacturing organisations.

1.4 Research Questions

1. What impact does information technology have on procurement performance in manufacturing firms?
2. What effect does information technology have on procurement planning in manufacturing firms?
3. What effect does procurement planning have on procurement performance in manufacturing firms?
4. How does procurement planning affect the link between information technology and procurement performance in manufacturing firms?

1.5 Significance of the Study

The research produced a wide range of benefits for businesses, particularly those engaged in manufacturing, governmental organisations, and academic institutions. As a result, the research has relevance for a variety of fields, such as management, policy development, academia, and theoretical frameworks. In the context of manufacturing firms, the current analysis focuses on the mediating function of procurement planning in the relationship between information technologies (IT) and procurement performance.

The aim of this research is to advance our theoretical knowledge of the use of procurement planning in the field of IT adoption. Few studies have looked at the indirect effects of information technology (IT) on procurement planning, despite the fact that the impact of IT on procurement performance has been researched. The goal of the present research project is to close the aforementioned gap in the literature, which will expand our knowledge of how information technology-enhanced procurement procedures work in general. The research includes a variety of theories, such as the resource-based view (RBV) and the transaction cost

theory (TCT), in order to provide a comprehensive picture of the interplay between IT, procurement planning, and procurement performance. Furthermore, the study will investigate how the mediating impact of procurement planning varies depending on the kind of information technology used. This understanding will contribute significantly to the broader conversation about the deployment of information technology in businesses, particularly in the field of procurement. This technique will also help to improve understanding of the Resource-Based View (RBV) and Transaction Cost Theory (TCT) in the context of technology, offering an important contribution to the progress and applicability of these theories.

This study is expected to offer significant practical implications for manufacturing firms seeking to improve their procurement performance by implementing information technology. Through comprehension of the intermediary function of procurement planning, these organizations can enhance their IT adoption process by strategizing. Organizations can enhance their IT resource management, align their IT strategies with procurement objectives, and establish control mechanisms to ensure efficient execution. Ultimately, this will assist organizations in improving their procurement performance, attaining cost efficiencies, and obtaining a competitive advantage in the marketplace. The research outcomes possess the potential to provide direction to policymakers and industry regulators in the formulation of guidelines and standards for the implementation of information technology in procurement from a more comprehensive perspective. Through comprehension of the crucial significance of procurement planning, individuals can advocate for enhanced planning practices, offer supportive resources, and formulate policies that facilitate efficient IT adoption in procurement.

In addition, the research expanded our understanding of how manufacturing companies in Ghana may employ procurement planning to influence the link between information technology and procurement performance. The study may also serve as a jumping off point for anybody who wants to do their own research on the study's contributing components. This research aims to significantly advance the field by examining the mediation influence of procurement planning on the relationship between IT and procurement performance. The findings of the research are anticipated to have an immediate impact on how practises and policies are developed in industrial enterprises.

1.6 Scope of the Study

This study fills a research gap in procurement research, notably in Sub-Saharan Africa and Ghana, by investigating the mediation of procurement strategy between information technology (IT) and procurement performance in manufacturing firms. The research investigates the mediating influence of procurement planning on the link between IT and procurement performance by focusing on a particular manufacturing firm, Ghacem, situated in Ghana's Western Region.

1.7 Summary of Methodology

The scholar has embraced the research philosophy of positivism, whereby causal inferences will be utilized to uncover the relationship between variables (Cohen et al., 2011). According to Cohen (2007), the use of positivist research philosophy serves to improve understanding of constructs through empirical testing and methodologies, resulting in a higher level of validity and reliability. This study employs an explanatory research design as it aims to elucidate the correlation among three variables, namely procurement planning, IT, and procurement performance. The research sample comprises the entire workforce situated in the

manufacturing firms in Ghana. Key informants, who possess expertise in the subject matter, will be selected from among individual employees within the entities. The methodology employed for data collection will involve the utilization of a survey instrument. The process entails the creation of a methodical set of inquiries to serve as a tool for research, utilizing closed-ended multiple-choice questions that are based on the 5-point Likert-style rating system. This system provides respondents with a variety of options or responses to select from. The Data was statistically analyzed in SPSS and Hayes Process Macro module 4.0 using a 5-point Likert scale. Descriptive statistics were used to display data properties, whilst regression analysis was used to investigate variable correlations based on research hypotheses for results.

1.8 Limitations of the Study

While this research has the potential to add to the literature on procurement planning's mediation in IT-procurement performance connections for manufacturing, its limitations must be acknowledged. The extent of the results might be limited to this unique environment, limiting generalizability across industries with various procurement procedures and technology needs.

Furthermore, there exist several other variables that were not addressed in this research that could potentially influence the mediating role of procurement planning. Possible academic rewrite: Some of the factors that may affect the success of organizational change initiatives are organizational culture, leadership approach, employee competencies, and change resistance, among other potential variables. While these factors are beyond the scope of this research, they could affect the relationship between IT, procurement planning, and procurement performance. Thirdly, the research is dependent on self-reported data obtained

from individuals who are affiliated with the manufacturing companies. This method may generate response bias because participants may offer socially desired replies or may not correctly remember all procurement planning and performance data. The potential impact of this circumstance on the validity of the study's results cannot be overlooked.

1.9 Organisation of the Study

The work is organised and demonstrated in five chapters. It begins with a broad introduction: the study's context, issue description, research goals, and research questions that must be addressed at the conclusion of the research. The first chapter discussed the study's scientific significance, breadth, and limits. The second chapter covers pertinent literature that supports the work in the literature review. The methodology of the research is described in the third chapter. The section examines the study design, population, sampling procedure, data collecting, and analytic techniques closely. The fourth chapter examines the study's results. This sheds further insight on the research. The last chapter summarises the study's results, conclusions, and suggestions.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

The study's chapter on the issue of how procurement planning mediates the link between information technology and procurement performance in manufacturing organisations explores pertinent and related research. The chapter begins with the definitions and explanations of concepts for the major components of the study, which include IT, procurement, and procurement performance. Also, theories were adopted to explain the relationships and it follows with an empirical review and hypothesis formulation of the concepts, and finally draws out and explains the conceptual framework of the study.

2.1 Conceptual Literature Review

This section of the literature review presents the conceptual review. In particular, the main constructs used in this study are IT and procurement performance.

2.1.1 Procurement

Tutu et al. (2019) describe procurement as the process of acquiring commodities, works, and services. The scope of this encompasses not only the act of procuring goods through purchase but also the engagement of contractual agreements or professional consultants for the provision of services, as noted by Adusei and Awunyo-Vitor (2015) and Tutu et al. (2019). According to Komakech (2016), the procurement process necessitates adherence to rigorous standards, including the provision of high-quality service, cost-effectiveness, optimal

performance, and equitable competition. Hence, a standardized process must be adhered to that is universally applicable to all agreements pertaining to commodities and services.

The following definition is supported by the Oxford Advanced Learner's Dictionary (2001) and the International Bank for Reconstruction and Development's (2004) Guidelines for Procurement. Musanzikwa (2013) defines procurement as a systematic process that includes product and service sourcing, acquisition, and operations ranging from supplier identification through customer delivery. This method strives to meet the needs of the consumer in terms of quantity, quality, timeliness, and location, with a focus on cost-effectiveness. Managing external resources to fulfil organisational objectives is how the Chartered Institute of Purchasing and Supply Australia (2005) defines procurement. According to Thai (2001), the procurement process, which is a management framework, contains many phases that need careful planning for procuring commodities, projects, and services.

2.1.2 Procurement Planning

In order to ensure the efficacy of the entire operation, the process of procurement planning, according to Mutoro, Makokha, and Namisonge (2018), comprises defining procurement needs and figuring out the time for their purchase and finance. Asakeya (2014) claims that procurement planning is a multidimensional process that requires the participation of several kinds of professionals. Wambui (2013) defines procurement planning as the methodical method used by organisations, both public and commercial, to plan and arrange procurement operations for a certain time period. The process of procurement planning entails the identification of required purchases, the choice of the most effective ways to fulfil project requirements, the specification of the range of goods, works, or services needed, the choice of suitable procurement strategies, the establishment of time frames, and the assignment of responsibilities for the entire procurement process. Most people agree that procurement

planning is important, especially when it comes to complicated projects that take years to complete and/or need large financial commitments. Such initiatives are more vulnerable to shifting needs and people, and therefore come under more examination. However, it seems that proper planning is not carried out as often as is required. During the early stages of procurement projects, it seems that the importance of planning as a critical project activity is not properly stressed; nonetheless, its absence becomes clear as the projects near their conclusion.

According to Ansah and Normanyo (2017), procurement planning is supported and encouraged by project management professionals and governmental bodies like MMDAs, who acquire works, materials, and services worth millions of cedis for government projects. This is due to the possibility of discontent and time-consuming setbacks if procurement strategy is not implemented or a consequent contract is not established. When reviewing the specifics of what went wrong, the lack of procurement strategy is often shown to be the main factor. Ingold et al. (2019) claim that the procurement planning process helps to build a clear knowledge of the essential products or services and their timetables, which is advantageous to both the buyer and the end-user.

Effective procurement planning and implementation are crucial for achieving business efficiency. This necessitates the identification of a dependable supplier who can offer cost-effective products or services (Harris et al., 2021). The idea of good value for money includes more than just the lowest possible cost because it also takes into account a number of other factors, such as the quality of the good or service, compliance with the specifications provided in the tendering process, and the extent of the after-sale support. The general public, who are the ultimate source of the monies being spent, is responsible for holding specialists

in the area of public procurement accountable, according to Handfield's (2011) views. This applies to both those who have made failed tender submissions and potential providers. Agarchand and Laishram (2017) outlined three main functions of procurement planning in their research. First and foremost, it tries to clarify and, to the degree possible, quantify the technical, financial, and time goals of the procurement. It also aims to provide a strategy for accomplishing the goals. Finally, it tries to determine a way for evaluating performance in relation to the stated goals while the contract is being carried out. A procurement strategy may be required depending on how complex, sensitive, or expensive the demand is expected to be.

2.1.4 Information Technology

According to Patel, Patel, and Scholar (2016), the field of information technology (IT) involves the utilization of various digital tools, such as computers, software, and networks, to facilitate the storage, processing, retrieval, and transmission of information. The swift advancements in information technology have brought about a significant transformation in the operational procedures of businesses, thereby establishing it as a fundamental element of organizational strategy and competitiveness (Cichosz, Wallenburg, and Knemeyer, 2020). The literature suggests that the implementation of information technology (IT) has the potential to enhance operational efficiency, facilitate effective decision-making, and promote innovation. This is supported by the findings of Shahzad, Xiu, and Shahbaz (2017) and Susarla and Mukhopadhyay (2018). According to Rai, Patnayakuni, and Patnayakuni (2012), the utilization of IT has the potential to enhance collaboration and coordination both within and between organizational boundaries, ultimately resulting in heightened levels of efficiency and productivity.

According to research (Coulthard and Castleman, 2001; Hooper and Holtbrügge, 2020), the use of information technology (IT) in procurement may increase performance by streamlining procedures, cutting transaction costs, and increasing transparency. The use of e-procurement technologies has been linked to cycle time reduction, improved supplier cooperation, and cost reductions, according to Rotich and Okello (2015). Information technology (IT) and organisational performance are intricately linked and dependent on a number of variables, including the organization's readiness, the adoption plan, and the alignment of IT with business processes (Van Looy, 2021). In order to properly use information technology's capabilities within organisational settings, it is important to understand these variables, according to the academic literature (Rudko, Bashirpour Bonab, and Bellini, 2021; Suzuki, 2011). It has been highlighted that information technology (IT) has a significant influence on procurement performance. This is because it can automate procedures, reduce transaction costs, enhance supplier relationships, and promote transparency, claim Amemba et al. (2013). According to study by Oyebanjo and Tengeh (2020), e-procurement systems, a subset of information technology, have been shown to shorten procurement cycle times, promote supplier collaboration, and lead to cost savings.

Information technology also enables better data management, providing insightful insights into procurement processes that may be used to improve the calibre of strategic planning and decision-making (Handfield, Jeong, and Choi, 2019). Organisations may benefit from using IT techniques like big data analytics to help them go through enormous volumes of procurement data and spot patterns and trends. In order to guide procurement plans and choices, Wang et al. (2016) demonstrate how this information might be used. Information technology (IT) deployment in organisational contexts often encounters a variety of

challenges, including resistance to change, inadequate IT infrastructure, and a lack of human resources (Tarhini, Ammar, & Tarhini, 2015).

In addition, enterprises encounter the obstacle of choosing suitable information technology tools and systems that are in accordance with their commercial goals and procedures (Huang, Newell, & Galliers, 2012). According to research, there are a number of challenges that prevent small and medium-sized enterprises (SMEs) from integrating information technology (IT), including financial limitations, a lack of IT expertise, and managerial reluctance to allocate funds for IT investments (Moghavvemi, 2018). In order to surmount these obstacles, it is imperative for organizations to embrace tactics that enable the triumphant integration of information technology. These tactics may include cultivating a culture that is conducive to information technology, allocating resources towards employee training, and prioritizing information technology investments based on their potential return on investment (Tarhini et al., 2015). According to Rai et al. (2012), the utilization of IT has the potential to enhance communication and collaboration with suppliers, optimize information sharing, and simplify supplier evaluation procedures. The aforementioned can result in enhanced supplier relationships, superior negotiation results, and heightened procurement performance. The impact of information technology (IT) on improving supplier relationships is subject to various factors, including the type of relationship, the supplier's willingness to embrace IT, and the compatibility of the IT systems employed by the buyer and the supplier (Hartley, Lane, & Hong, 2013).

2.1.5 Procurement Performance

According to Bienhaus and Haddud's (2018) in-depth research, supply chain management and operations management have both shown a great deal of interest in the examination of

procurement performance. As a function, procurement has a significant influence on an organization's entire performance, including cost effectiveness, supplier relationships, and operational effectiveness (Bag et al., 2020). A multifaceted term that includes different components is procurement performance. Several performance factors, such as cost effectiveness, quality, delivery performance, adaptability, and innovation, have been presented by academics (Leuschner, Rogers, and Charvet, 2013). A well-known gauge of procurement performance is cost efficiency, which is often determined by cost savings. It displays the procurement function's capacity to control costs and negotiate advantageous terms with suppliers (Busse, 2016).

The standards of the purchased materials and the promptness of the deliveries, respectively, are related to the quality and delivery performance elements. Thai (2017) asserts that these aspects show how skilled the procurement department is in successfully managing supplier relationships. Additionally, innovation is concerned with the procurement function's contribution to product and process innovation via supplier engagement, while flexibility refers to the procurement function's capacity to adapt to changes in demand or supply circumstances (Edler and Yeow, 2016).

Jiang, Henneberg, and Naudé (2011) found that one of the most important aspects in determining procurement performance is the management of supplier relationships. Terpend and Ashenbaum (2012) claim that effective management of supplier relationships may lead to better negotiating outcomes, better-quality materials being purchased, on-time delivery, and more innovation. The amount of integration of the procurement function within the organisation and organisational elements like procurement policies and strategies have an influence on procurement performance as well (Nani and Ali, 2020). The performance of the

procurement depends heavily on the skills and talents of the workforce. The performance of the procurement process has been noted as being critically dependent on abilities including interpersonal, analytical, and negotiating skills (Stek and Schiele, 2021).

2.2 Theoretical Literature Review

An outline of the research's theoretical framework is included in this section of the literature review. Two main hypotheses have been given and addressed in this research. Specifically, the idea of social costs and the resource-based perspective. These theories provide a comprehensive framework for investigating and deepening our comprehension of IT and procurement processes. Each of the aforementioned hypotheses is explained in the section that follows.

2.2.1 Resource-Based View (RBV)

The resource-based view (RBV), a well-liked concept in the literature on strategic management, provides illuminating details on how organisations may leverage their internal resources to obtain a competitive edge (Barney, 1991). The core belief of RBV is that when resources are valuable, rare, unique, and non-substitutable (VRIN), they may provide organisations with a lasting competitive edge (Barney, 1991). In this situation, IT resources become important because they have a big impact on organizational operations, such as procurement. Businesses with efficient IT management and use have the ability to improve their performance in the procurement process (Liu et al., 2013). From an RBV standpoint, IT may improve the performance of the procurement process through efficiency and effectiveness. According to Wang, Tai, and Grover (2013), IT can speed up the procurement process and cut prices and lead times. Additionally, by improving supplier management and

risk mitigation, IT can increase the effectiveness of procurement (Sreedevi and Saranga, 2017).

Oh, Yang, and Kim (2014) argue that there are more factors at play than first thought in the direct relationship between IT and procurement performance, and they point to the important mediating function that other internal resources like procurement planning might play. According to RBV, procurement planning can increase the value obtained from IT resources because it is a strategic internal resource (Schmidt and Keil, 2013). Businesses can maximize the return on their IT expenditures and improve procurement performance by ensuring that IT applications are in line with procurement objectives (Brandon-Jones and Kauppi, 2018).

2.2.2 Transaction Cost Theory (TCT)

Transaction Cost Theory (TCT), which provides a framework for comprehending the economic considerations that influence how businesses choose to act, has been a mainstay in economics and management literature (Williamson, 1979). According to the Transaction Cost Theorem (TCT), organizations want to reduce transaction costs, which include the expenses related to searching for, negotiating, monitoring, and enforcing agreements in economic transactions (Coase, 1937; Williamson, 1979). By automating procedures, boosting transparency, and enhancing interparty communication, IT can significantly contribute to lowering transaction costs (Malone et al., 1987). TCT experts believe that IT can improve the efficiency of procurement by finding different ways to cut expenses. For instance, IT may support electronic sourcing, which lowers search expenses by enabling businesses to find suitable suppliers more quickly and effectively (Schmidt and Wagner, 2019). IT can cut down on negotiating expenses by automating contract creation and optimizing communication (Omar et al., 2021).

In addition, TCT contends that procurement planning may increase the value received from IT resources by ensuring that IT applications are properly used to cut down on transaction costs (Akbar and Tracogna, 2018). Companies may maximize the return on their IT investments, resulting in increased procurement performance, by simplifying IT systems and coordinating them with procurement objectives. According to research by Marshall et al. (2019), procurement planning significantly mediated the relationship between IT and procurement performance in Dutch businesses. Chang and Wong (2010) similarly found that the use of IT in procurement only resulted in notable performance improvements when accompanied by efficient procurement planning in the UK public sector.

According to Zailani et al. (2012), achieving the benefits of IT in procurement requires careful planning. Planning for purchases improved the effect of IT on the performance of purchases, according to Liu and Kumar's 2022 research on Chinese companies. The complexity of some investigations has increased, though. For instance, Zhang et al. (2021) discovered that in some situations, external factors like market volatility could reduce the impact of procurement strategies. According to Cole, Stevenson, and Aitken (2019), in the context of blockchain technology in procurement, planning may need to be supplemented with skills like change management for the successful integration of IT.

2.3 Empirical Literature Review and Hypothesis Formulation

An empirical assessment of the study's performance in relation to its specified goals is provided in this section. Information technology (IT) and a company's procurement success have been correlated, as well as the mediating variables that influence this link, in a number

of academic studies. This version of the paper offers an empirical review that takes both research from rich and emerging countries into account.

2.3.1 Information Technology and Procurement performance

Numerous research studies have indicated that the integration of information technology (IT) in procurement processes can result in notable enhancements in operational efficiency (Aboelmaged, 2018). The adoption of electronic procurement (e-procurement) had a favorable correlation with procurement performance, according to the study by Aboelmaged (2018), which used a sample size of 317 manufacturing firms. The study by Aboelmaged has shown that the integration of suppliers and the standardization of procurement procedures are essential mediators in this association.

Barsemoi, Mwangagi, and Asienyo (2014) investigated the determinants influencing procurement performance in Kenya's private sector. The research design for this study was primarily descriptive. The study's focus group consisted of 169 Henkel Chemicals (E.A.) workers at various management levels. The research included both qualitative and quantitative data analysis techniques. The research results demonstrate that the use of information technology (IT) in Henkel Chemicals' (E.A.) procurement process had the highest link with procurement performance as assessed by service delivery when compared to components such as employee competence and organisational management.

The study conducted by Kiragu (2012) aimed to evaluate the influence of information technology on the procurement procedure within the Kenyan context. The utilization of information technologies in procurement procedures will have an impact on the manner in which tasks are executed, the quantity and proficiency of contracting staff, and the

configuration of the procurement entity. The research employed stratified random sampling methods to choose a sample of 37 workers from a population of 124. A set of questionnaires was disseminated among the participants, and a total of 30 questionnaires were duly completed and returned. The research findings suggest that the efficacy of technology in enhancing the contracting process is contingent upon the collaborative efforts of data maintenance and data utilization organizations. Procurement systems offer the potential to move organizations closer to an integrated yet modularized system that is adaptable to various purchasing routines typically implemented within an organization.

Gunasekaran and colleagues (2016) provided additional evidence to support the notion that procurement systems enabled by information technology can enhance the efficiency of supply chain operations, ultimately resulting in improved procurement outcomes. The authors showcased the potential of sophisticated information technology tools in attaining strategic procurement goals through improved cost effectiveness and supplier partnerships. The green supply chain comprises a network of providers, producers, storage facilities, and distributors who collaborate to turn plans and raw materials into the final product while considering the environmental outlook across all phases (Marinagi et al., 2014). The utilization of information technology (IT) has enabled the exchange of information to occur with greater ease. Nonetheless, in contemporary society, IT has assumed a prominent role in the daily lives of individuals (Pattinson, 2017). The integration of a sustainable supply chain necessitates the utilization of IT capabilities, as they enhance the eco-friendliness of the organization's communication and transportation infrastructure. This facilitates the participation of clients and other stakeholders.

According to Mendoza-Fong et al. (2018), enhancements in procedures and communication will be made while simultaneously decreasing both environmental and financial expenses. Mishra et al. (2007) posit that the effective execution of a green supply chain is facilitated by IT capabilities, which result in cost savings and a more ecologically sustainable outlook throughout the supply chain. Moreover, the incorporation of information technology (IT) capabilities plays a pivotal role in enhancing an organization's reverse logistics for the development of environmentally friendly products and procedures within the framework of a green supply chain. According to Uygün and Dede's (2016) research, the adoption of a green supply chain can mitigate or eliminate the negative environmental impacts associated with supply chain operations. Moreover, it will facilitate the enhancement of the technological and innovative competencies of the organization.

Similarly, the area of information technology (IT) should have a positive influence on both the ecological sustainability and the design of goods. According to Lee et al. (2014), allocating resources to information technology may help to foster technological innovation within the framework of ecologically friendly supply chain management. The research has demonstrated a link between investment in information technology and company and economic growth (Jorgenson & Vu, 2016). (26), information technology (IT) skills are seen as an important aspect in improving the execution of a sustainable supply chain. Enhancing a company's information technology skills has been highlighted as a crucial aspect in fostering environmental sustainability, according to de Camargo, Fiorini, and Jabbour (2017) study. This is because it assists in the gathering of information and planning to increase the capability for successful environmental compliance.

The 2018 study by Cheptora, Osoro, and Musau is a noteworthy piece of research. This research attempts to look into the factors that affect the success of Kenya's manufacturing sector's procurement, with a focus on Nzoia Sugar Company Ltd. The goal of the research was to determine the relevance of each of the four independent factors for procurement performance: management style, information and communication technology, staff competence, and procurement policy. Descriptive research techniques were used to conduct the study. The study promotes the use of electronic data exchange (EDI) to streamline the procurement process as well as the prompt and efficient execution of procurement duties. The research also recommends that the company develop plans to improve the development and promotion of its employees and guarantee compliance with procurement laws.

Chebets and Kihara's research from 2022 sought to determine how e-procurement affected the performance of procurement among industrial companies based in Nairobi County. The technological acceptance model served as the foundation for the study. A descriptive-explanatory research approach was adopted for this investigation. Semi-structured questionnaires were used to collect the study's main data. Tabular, pictorial, and circular representations were used to communicate the information. The results showed that e-procurement's adoption had a favourable effect on procurement efficiency in the industrial sector.

Nyakundi (2018) did research on the topic. Analyse the best procurement strategies and gauge the effectiveness of Nairobi County's small and medium-sized businesses (SMEs) in this regard. The study used a cross-sectional descriptive research methodology and a random sampling approach to choose forty-five (45) SMEs operating in Nairobi's CBD from the total of 420 SMEs for the study. As the primary instrument for gathering data, the researcher

employed questionnaires. Data collected from 40 respondents spanning the commerce, production, building, and service sectors were analysed using SPSS (version 22). The results showed that all the independent variables (green purchasing, supplier partnerships, information technology adoption, and purchasing ethics) had a positive impact on procurement performance.

The impact of e-procurement on the effectiveness of procurement at the Sarova Chain of Hotels is examined by Mwangi and Kagiri (2016). This study used a descriptive research approach. In order to analyse the quantitative data that was collected, SPSS (Version 20) was used. Percentages, means, standard deviations, and frequencies were then used to communicate the results. The research's conclusions show that using e-tendering has improved adherence to procurement policies, while using e-sourcing has made it easier to gather information about rivals and create competitive intelligence. Enterprise resource planning (ERP) adoption is clearly important for managing ideal inventory levels and ensuring that items are stored in the right amounts. The use of electronic procurement has the potential to reduce purchase costs overall.

The influence of information and communication technology (ICT) on the efficiency of procurement within the amount of energy sector of state enterprises in Kenya is the subject of a research done by Muriuki, J.I. (2021). The study's goal was to ascertain the effects of communication technology, software for apps, information technology, e-procurement policy, and technical support personnel on Kenyan state companies' procurement performance in the energy sector. Through the use of the design of descriptive surveys and a correlational design, the study applied an exploratory technique. The research focused on a sample of 355 procurement workers and 25 technical support personnel for electronic procurement from

nine state enterprises in Kenya's energy industry. The study's findings imply that a number of variables, including communication technology, software for applications, information technology, electronic procurement regulations, and technical support personnel for electronic procurement, have a favourable effect on procurement performance. Based on empirical evidence from both developed and underdeveloped economies, the present study posits the following proposal:

H1: There is a positive relationship between IT and procurement performance

2.3.2 Information technology and Procurement Planning

Extensive research has been conducted on the implementation of information technology (IT) in procurement planning. The findings of these studies suggest that IT adoption can improve efficiency, transparency, and strategic decision-making (Aboelmaged, 2018; Gunasekaran et al., 2016). According to Aboelmaged's (2018) research, which involved 317 manufacturing firms, the implementation of e-procurement resulted in enhancements in procurement planning procedures. The implementation of this system allowed for a more efficient dissemination of information, resulting in an optimized allocation of resources and a reduction of expenses. Gunasekaran et al. (2016) have indicated that the implementation of IT-enabled procurement planning systems has the potential to improve strategic decision-making by providing insights into supplier performance and market trends.

According to a study by Kull et al. (2017), the implementation of ERP systems improved procurement planning through the integration of data from various departments, which in turn improved decision-making processes. The authors, however, issued a warning regarding the potential technical and organizational obstacles that may arise during the implementation of an ERP system. Cagliano et al. (2015) proposed that the adoption of EDI could optimize

procurement planning by facilitating instantaneous information exchange between buyers and suppliers, minimizing human errors, and expediting transaction procedures. The study conducted by Oliveira et al. (2019) validated the efficacy of e-procurement tools in augmenting procurement planning through the reduction of cycle times and the enhancement of supplier performance. The utilization of these tools facilitated transparency through the provision of convenient access to procurement data.

The role of information technology in the planning of strategic procurement has been a subject of particular attention. According to the study by Scholten and Foerstl (2017), the use of information technology (IT) in supplier collaboration platforms can be helpful in facilitating strategic procurement planning. The implementation of these platforms facilitated enhanced communication with suppliers, thereby aiding in the prediction and alleviation of potential disruptions in the supply chain. The significance of information technology in enabling sustainable procurement planning has garnered increased attention in recent times. According to Touboulic and Walker (2020), the utilization of IT tools has the potential to facilitate the monitoring of suppliers' environmental and social performance, which can subsequently be integrated into procurement planning to promote sustainability. Numerous studies have demonstrated the favorable influence of information technology on procurement planning. However, certain gaps in research remain. According to Ho et al. (2021), there exists a restricted comprehension regarding the enduring impacts of information technology (IT) on procurement planning. Additionally, Johnston et al. (2023) have highlighted the untapped potential of developing technologies like artificial intelligence and blockchain in the field of procurement planning. Based on empirical evidence from both developed and underdeveloped economies, the present study posits the following proposal:

H2: There is a positive relationship between IT and procurement performance

2.3.3 Procurement Planning and Procurement Performance

There is a strong correlation between purchase planning and performance, according to a number of empirical research. 186 Kenyan procurement managers made up the sample size for Kamau's (2018) research. The findings showed that planning for purchases had a big influence on how well purchases performed, especially in terms of cost reductions, quality improvements, and delivery time. In Ghana's public hospitals, Agyemang and Amo (2017) discovered a strong link between procurement planning and performance. Due to this association, supplier relationships improved, lead times were shortened, and cost savings were increased. Research by Liu and Ye (2020) in the Chinese manufacturing sector revealed that strategic sourcing, in particular, has a beneficial effect on procurement performance. This was accomplished by increasing supplier performance, lowering buying expenses, and improving contract compliance. According to the research that is currently accessible, procurement planning is essential for improving procurement performance.

In 2018, Cheptora, N.C., Osoro, and Musau, E.G., published a piece. With a focus on Nzoia Sugar Company Ltd., this research seeks to determine the factors that affect procurement success within Kenya's manufacturing sector. The goal of the study was to evaluate the statistical impact of all four independent factors on the effectiveness of the procurement process: management style, information and communication technology, personnel competence, and procurement policy. The study's methodology was a descriptive research approach. The research's conclusions show that the management approach used, with employee engagement playing a key role, has a major impact on the procurement performance of manufacturing organisations. Therefore, in order to improve procurement effectiveness, staff engagement must be given top priority. Additionally, a key factor in

streamlining the purchase process is the use of procurement rules. However, a significant portion of industrial companies show a lax attitude towards following such regulations, which eventually results in substandard procurement outcomes. Okello and Wee's (2019) study looked at the organisational culture's moderating effects in Uganda. According to the research, procurement planning improved procurement effectiveness, and this impact was further boosted by an organisational culture that valued collaboration and communication.

According to Ali and Ahmed (2021), a company's level of digital preparedness is a key factor in enhancing the influence of procurement planning on performance. The aforementioned finding indicates that organisations with a high degree of digital readiness may use technology solutions to automate procurement planning processes, which will increase the effectiveness of procurement. The study posits a proposition based on evidence from both developed and underdeveloped economies.

H3: There is a positive relationship between Procurement Planning and procurement performance

2.3.4 Procurement Planning, information Technology and Procurement Performance

The goal of the research by Okinyi and Muturi (2016) was to investigate the many elements that affect the effectiveness of public procurement in a Kenyan county with devolved administration. The first stage in the investigation's success was determining how workers' professional credentials impact the efficiency of the public procurement process. The second goal is to assess how information and communication technology (ICT) has affected the effectiveness of the procurement function in the context of public procurement. Establishing the impact of contract management on the effectiveness of the public sector's procurement process is the third step, and the impact of the procurement planning process on that process is the last step. The study found a strong association between the success of ICT procurement

and the adoption of simplified public procurement processes that demonstrate a high degree of integration, outperforming the levels of conventional manual procurement processes in terms of efficiency. ICT integration enhances customer service delivery, making it easier and more effective; good contract management in public procurement contributes to public sector efficiency. IT might greatly enhance procurement performance, according to Gunasekaran and Ngai (2016), by boosting efficiency and lowering transaction costs.

The goal of Fekpe and Fiagbey's research from 2021 is to determine how the usage of information technology (IT) affects how well supply chains work for industrial companies operating in developing nations. Purposive sampling and survey research methods were used in the study to gather information from a sample of 85 businesses. It was shown that there is a significant correlation between supply chain efficiency and IT utilisation. Additionally, cooperation acts as a mediator with a significant impact on the relationship between IT use and supply chain performance. The study highlights the significance of inter-organizational collaboration and information technology implementation in enhancing the supply chain efficacy of manufacturing enterprises situated in underdeveloped nations, particularly those with cross-border partners. Njenga and Onyango (2020) in Kenyan public institutions also found that IT adoption in procurement led to improved efficiency, reduced procurement lead times, and increased transparency.

Okello and Wee (2019) discovered that procurement planning was critical in mediating the favourable influence of information technology (IT) on procurement performance across Ugandan governmental institutions. According to the findings of the research, the use of information technology allowed the automation of procurement planning activities, resulting in increased procurement effectiveness. Ali and Ahmed (2021) did research in which they

discovered procurement planning to be a mediator in the association between digital readiness, a kind of IT adoption, and procurement performance in Pakistani organisations. According to the findings of the research, the existence of digital readiness had a major impact in expediting procurement planning operations, resulting in improved procurement performance.

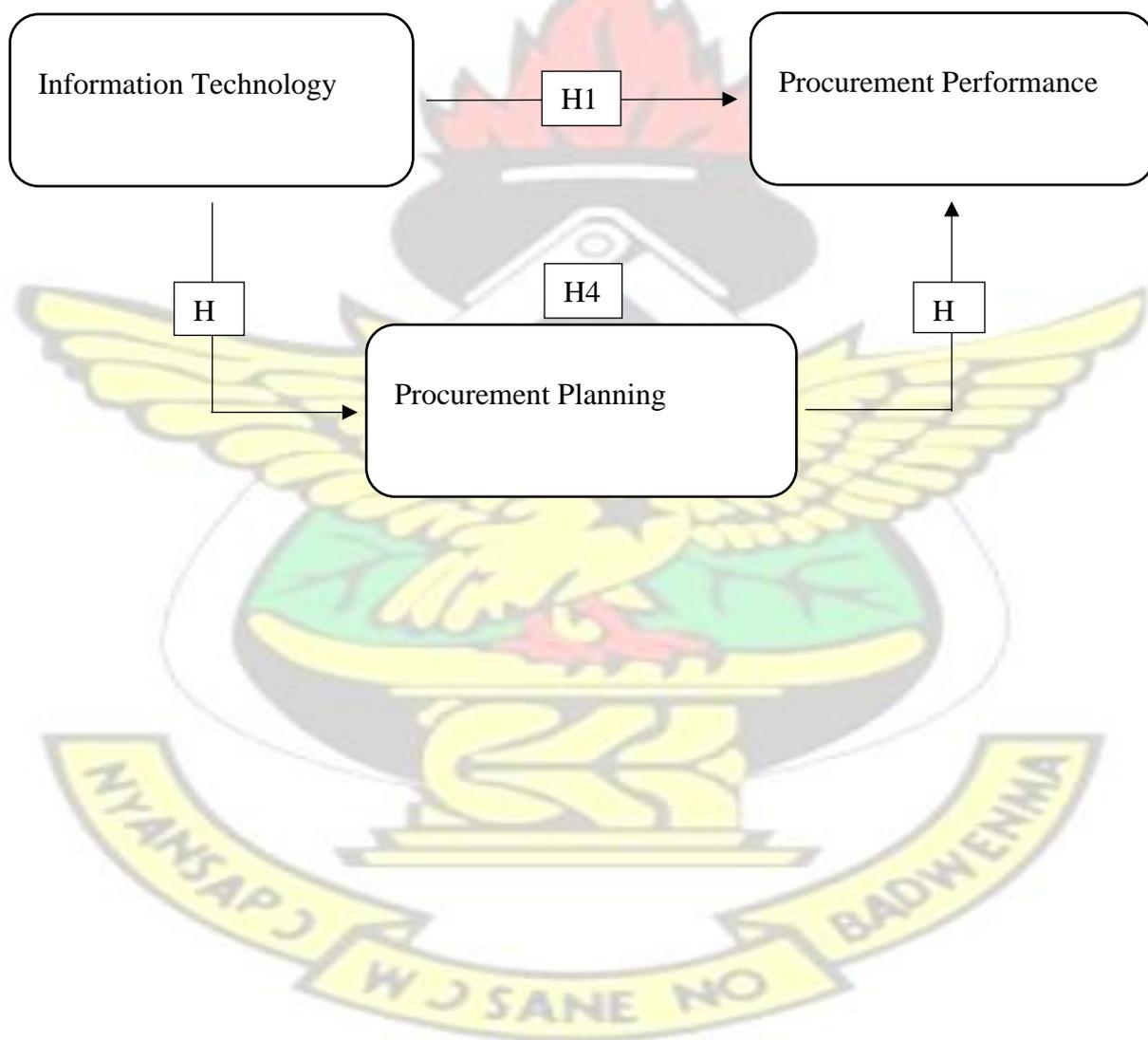
In their study of Chinese manufacturing businesses, Liu and Ye (2020) observed that procurement planning played a critical role in mediating the positive relationship between IT adoption and procurement performance. The findings of this research show a link between procurement strategy and the influence of information technology on procurement performance. While procurement planning's importance as a mediator has been proven, many research have also shown the involvement of several moderating elements. According to Kamau's (2018) study, organisational culture has a substantial influence on the interaction between information technology, procurement strategy, and procurement performance in Kenyan firms. According to the findings of this research, the influence of information technology (IT) on procurement performance through procurement planning is more obvious in organisational contexts where cultural norms prioritise collaborative cooperation and effective communication. According to Agyemang and Amo (2017), the mediating impact of procurement planning on the connection between IT and procurement performance was mitigated by organisational size. Large organisations were more likely to use IT in procurement planning, which resulted in better procurement performance. Based on the aforementioned information, it can be inferred that the study posits that:

H4: procurement planning will significantly mediate the relationship between IT and operational performance

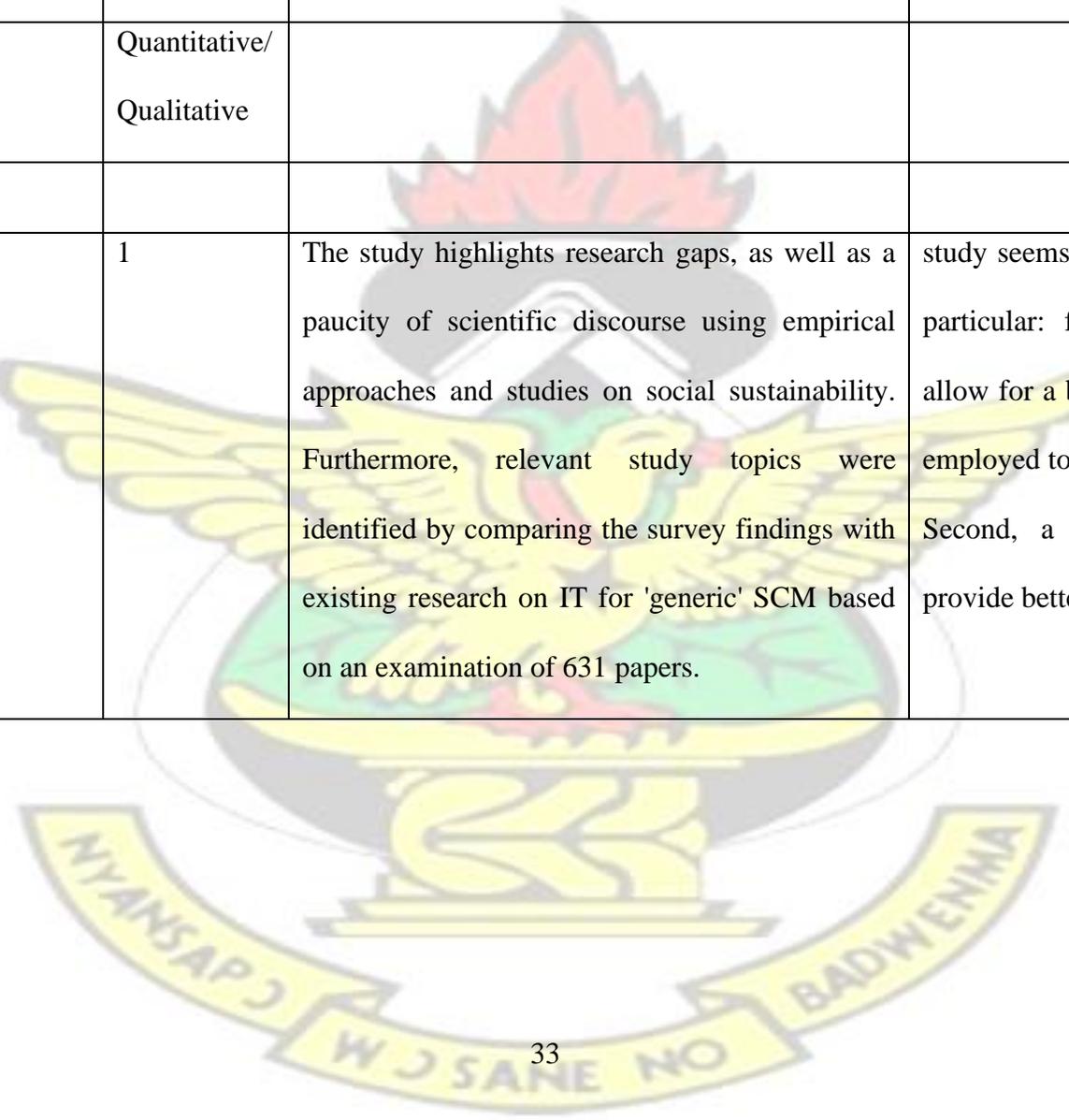
2.4 Conceptual Framework

The conceptual framework is a graphic depiction that shows how different conceptions are related to one another. The links between distinct notions are visually represented in the conceptual framework. The conceptual framework that analyses the effect of information technology (IT) on procurement performance is introduced in the current research. Based on this assumption, Figure 2.1 is shown.

Figure 2.1 Conceptual Framework



Research Context	Theoretical Foundation	Method	Key Results/Findings	Proposed Future Research
Country/Continent		Quantitative/ Qualitative		
		1	<p>The study highlights research gaps, as well as a paucity of scientific discourse using empirical approaches and studies on social sustainability. Furthermore, relevant study topics were identified by comparing the survey findings with existing research on IT for 'generic' SCM based on an examination of 631 papers.</p>	<p>study seems to be missing in three categories in particular: first, more empirical study would allow for a better knowledge of how IT is being employed to enhance supply chain sustainability. Second, a more quantitative emphasis may provide better decision assistance.</p>



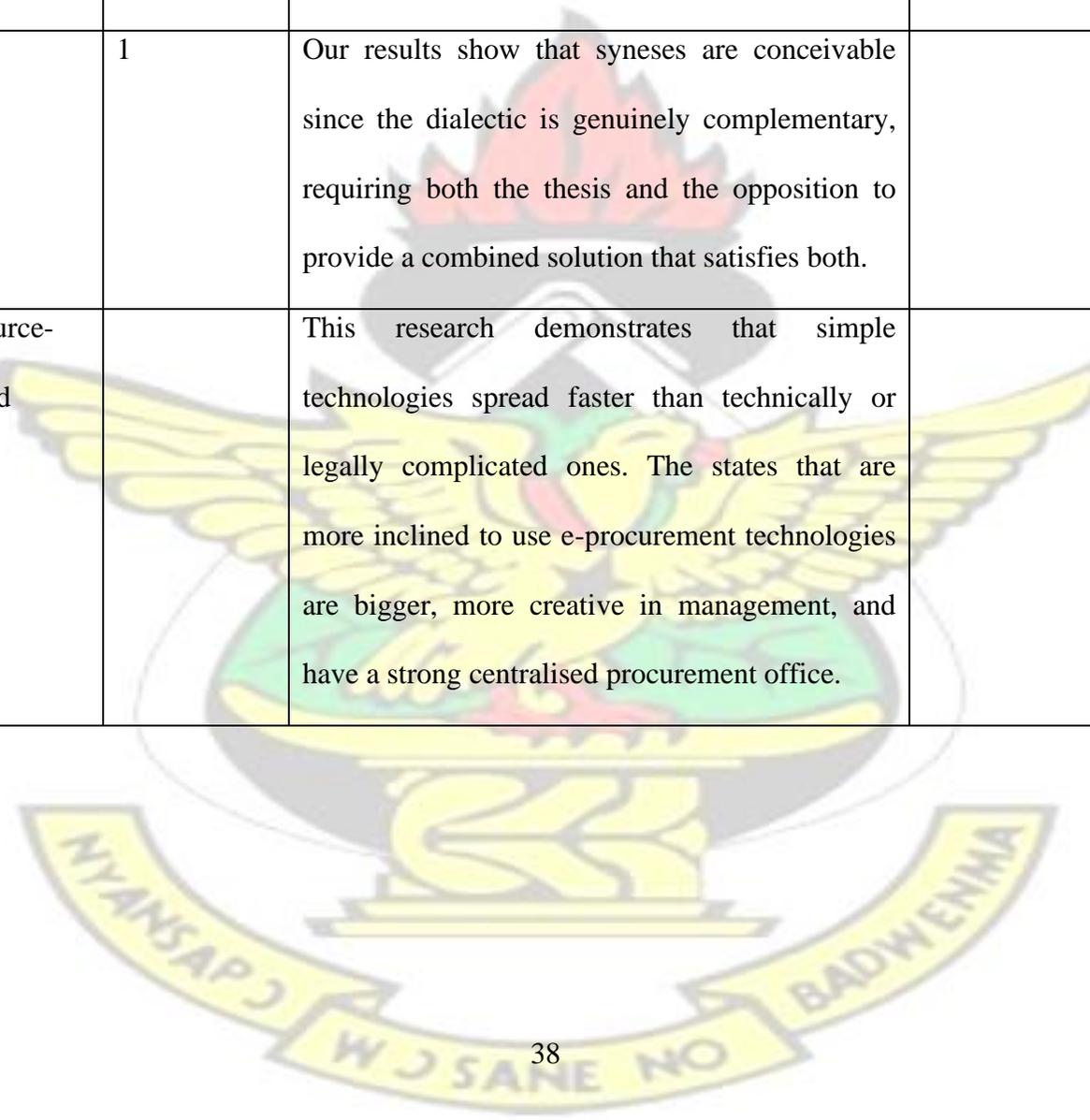
USA	Agency theory/The transaction cost theory/Public choice theory/Democratic accountability theory	1	The concept and practise of project public procurement appear to be consistent with the ideology and prescriptions of both the public choice theory and the agency theory, but the implications for transaction cost theory, with an emphasis on efficiency alone, appear to conflict with the notion of "small is beautiful" and achieving democratic accountability.	
Sweden		1	All levels of the procurement process provide challenges in the use and implementation of welfare technology. Barriers are found in the need examination, demand definition, and market analysis during mapping and planning. Economic resources, standardisation, and interoperability	Future study should take a broader look at the processes and interactions between suppliers and municipal actors, as well as explore procurement practises from the supplier's point of view.

		<p>all impede the procurement process at the procurement stage. Supplier evaluation, regulations, cross-organizational cooperation, and political strategy all complicate implementation and administration.</p>	
Korean	resource-based view	<p>When links between IT competence and company performance are studied with the inclusion of additional resources such as e-procurement system type, the impact is greater. Collaboration capacity had a bigger influence on financial performance when e-procurement had a low information exchange function and an elevated market-making function. However, when a system for electronic procurement has restricted search features, the dynamic capacity</p>	<p>Future research should develop additional metrics to compensate for cognitive measuring constraints or to supplement interpretations of findings by using qualitative data in the analysis. In the end, this research reduces and examines e-procurement features into four components.</p>

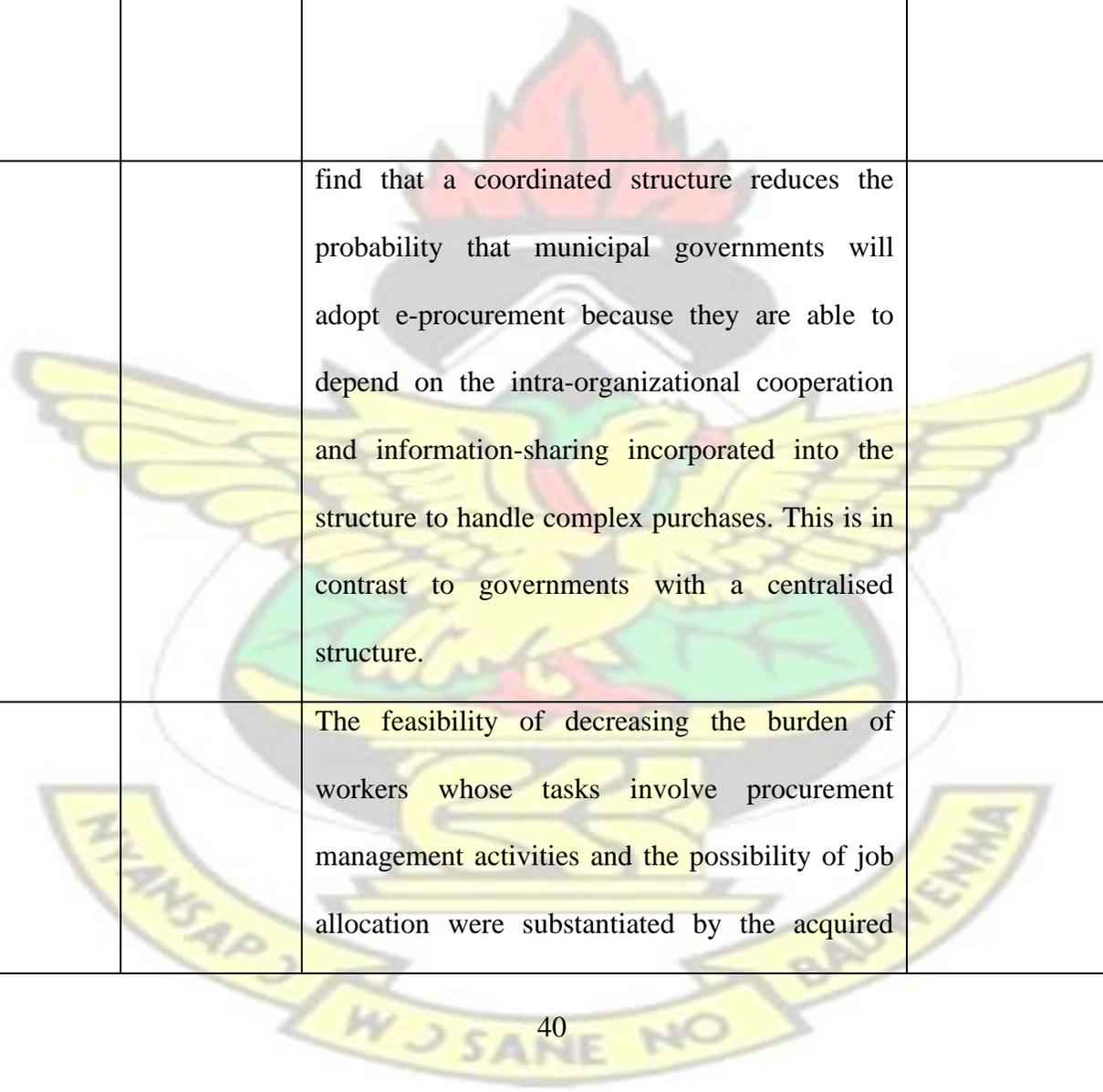
			contributes more to financial performance.	
Spain	resource-based view		<p>The results show that the novelty of the service for the organisation, time limitations, and people' personal interest in a service-purchase choice all led to an increase in Internet usage throughout the buying process. Furthermore, the findings indicate that the purchasing phase has a significant influence on the intensity of Internet tool usage in service procurement. When acquiring services, businesses must take use of the Internet's advantages as a distribution and communication platform.</p>	<p>One future objective of our study is to include two types of repercussions into the suggested model in future studies: organisational and financial. We also want to investigate the probable impacts of interaction between deciding elements and the implications of e-procurement in the organisation, and so develop a comprehensive structural model that will assist us in moving ahead in understanding this novel and intriguing process.</p>

Sweden		1	<p>Ninety tender proposals for 11 categories of HWT satisfied the inclusion requirements for assessment, representing possible contracts valued 246 to 296 million EUR. In 16 calls for bids totaling 183 million EUR in prospective contracts, proof of effectiveness criteria were employed. To validate such proof, eight of the requests referenced to an established independent standard, such as the CE standard of compliance, MDR and/or MDD. This predominance seems to be shared by all kinds of procurement entities and HWT. The use, or lack thereof, of any evidentiary criterion seems to have no effect on the bidding process's results.</p>	<p>When acquiring and deploying HWT, these stakeholders should collaborate with HWT developers and researchers to provide high-quality, locally relevant evidence.</p>
UK		1	<p>Technological advances are altering supply chain and procurement processes at an increasing rate.</p>	<p>More study is required to assess the cost-benefit analysis, technical and economic viability of</p>

				each technology in the procurement process and other organisational tasks.
Sweden		1	Our results show that syneses are conceivable since the dialectic is genuinely complementary, requiring both the thesis and the opposition to provide a combined solution that satisfies both.	
Korea	resource-based		This research demonstrates that simple technologies spread faster than technically or legally complicated ones. The states that are more inclined to use e-procurement technologies are bigger, more creative in management, and have a strong centralised procurement office.	



Finland	resource-based		<p>According to the findings, there are positive and substantial correlations between digital procurement skills, data analytics capabilities, and supply chain performance. The beneficial association between outside data analytics abilities and supply chain performance is mediated by digital procurement skills.</p>	
		1	<p>The findings of this study offer multidisciplinary IS/OSCM scholars with possible research subjects, theories, and publishing venues in the SCM research domain.</p>	
Taiwan	resource-based view		<p>The findings support the premise that process efficiency and coordination skills greatly contribute to competitive advantage, but that IT capabilities resulting from Web-based direct purchase systems as a whole have no major</p>	<p>Although it was based on buying managers' replies on a Likert scale, the competitive advantage metric is arbitrary.</p>



			impact on this.	
USA			find that a coordinated structure reduces the probability that municipal governments will adopt e-procurement because they are able to depend on the intra-organizational cooperation and information-sharing incorporated into the structure to handle complex purchases. This is in contrast to governments with a centralised structure.	
			The feasibility of decreasing the burden of workers whose tasks involve procurement management activities and the possibility of job allocation were substantiated by the acquired	

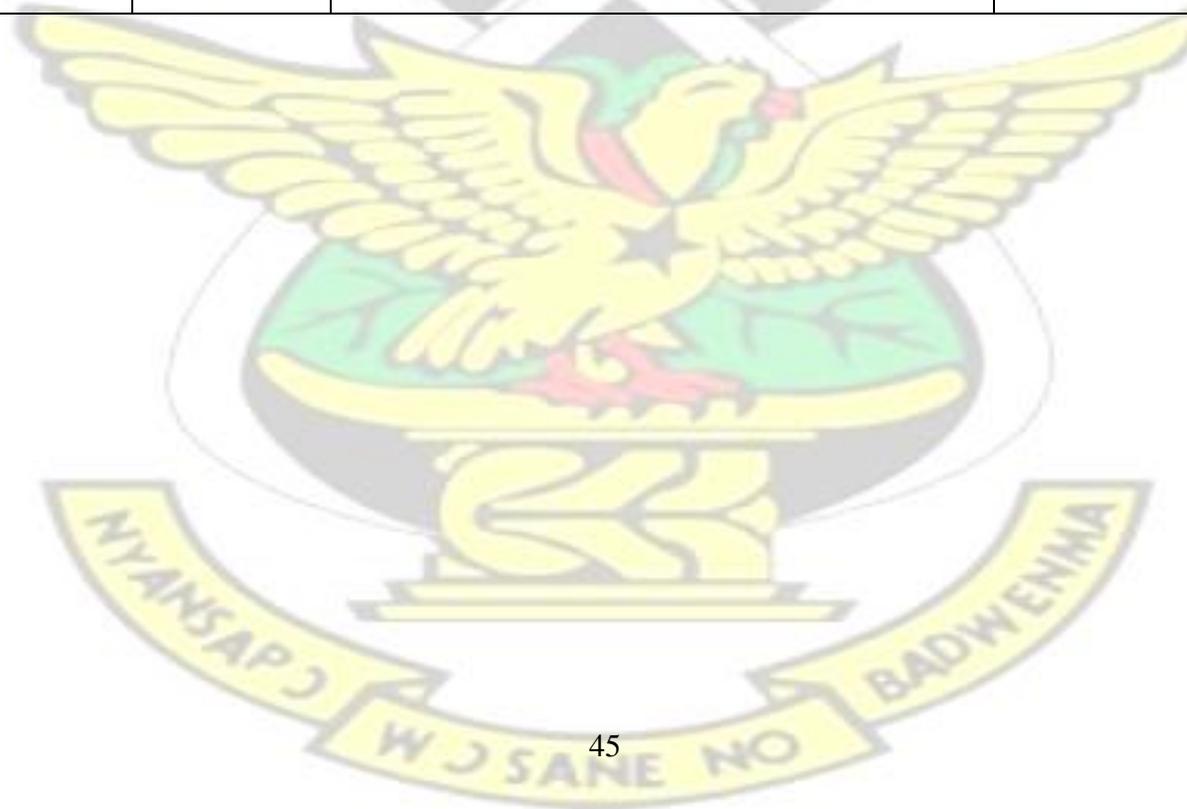
			results of the approval of such an organisational tool as RAM and the operational processes chart.
Indian			According to research, supply chain integration between suppliers and consumers involves a significant amount of mobile network utilisation.
Kenya	Technology Acceptance Theory		According to the report, e-tendering has increased compliance with procurement rules, and e-sourcing offers a way to gain a greater understanding competition and provide competitive intelligence. It was evident that business resource planning makes sure the items are stocked in the ideal amount. The entire cost of buying might be reduced by electronic procurement. Accordingly, the study's findings show that e-tendering, e-sourcing, business

			<p>resource planning, and e-informing adoption were all favourably associated to procurement success.</p>	
USA			<p>Suppliers are permitted to provide price reductions as described below in order to make their bids competitive. By lowering the unit price to \$602 (140.86 700), for instance, bid number one with a score of 0.860 may become efficient (in a DEA sense) with a score of 1.000 while retaining the same quantity of other qualities (in certain circumstances, slack changes for some of these attributes are required). If they intend to increase additional features while keeping</p>	

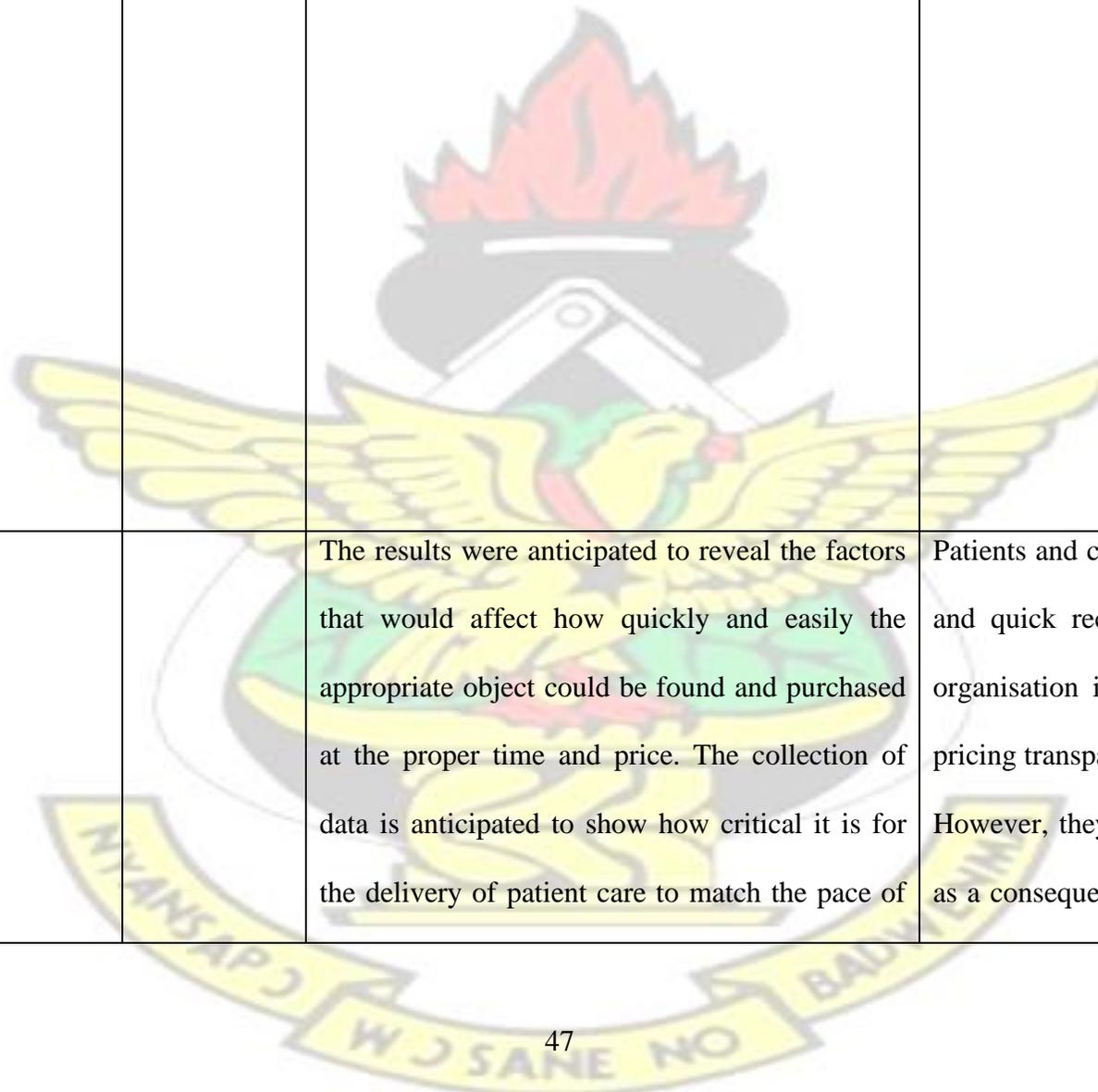
			<p>pricing constant, a similar analysis may be done. However, given that the quality and delivery levels cannot be higher than 100% in the present situation, some of these enhancements may not be practical.</p>	
Austria			<p>The study points up research gaps, a dearth of empirically grounded scientific discourse, and a dearth of studies on social sustainability. Additionally, after analysing 631 articles, potential study areas were determined by contrasting the survey findings with the present body of knowledge on IT for 'generic' SCM.</p>	<p>The classification of activities in the supply chain (Section 4.1) places little emphasis on nodes and reverse actions. Furthermore, as was the case in earlier research on sustainability in SCM in general (Seuring and Müller 2008; Section 4.3), relatively few writers discuss social concerns in conjunction with IT for SCM. Although other publications at least</p>

				encompassed social reasons in their talks with an environmental emphasis, just one study particularly focused on social concerns.
USA	Transaction cost and agency theory	1	There has been significant progress in public the management of projects in general and in public procurement in particular, but there is still much more to be done. Project public procurement appears to be consistent with the philosophy and recommendations of both the agency theory and the public choice theory, but its implications for transaction cost theory, which place a strong emphasis on efficiency alone, tend to run counter to the idea that "small is beautiful" and achieving	

			<p>democratic accountability. Despite the barriers posed by the conventional public procurement principles, which place a strong focus on gatekeeping and control orientations, innovations are being sought after and put into practise sometimes, and progress is being made in the appropriate directions.</p>	
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Swedish		1	<p>All phases of the procurement model provide difficulties for the use and implementation of welfare technologies. The need analysis, requirement definition, and market analysis are used in mapping and planning to identify impediments. Economic resources, standardisation, and interoperability impede the procurement process at this point. Legislation, cross-organizational cooperation, and political strategy all hamper implementation and administration. Using these results as a foundation, this research defines "procurement competence" as the technical, economic, legal, and ethical knowledge necessary to assess and evaluate welfare technologies. Early in the procurement process, technical and moral</p>	
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			<p>acumen are required, but later phases of the model call for legal and economic expertise.</p>	
<p>Malaysia</p>			<p>The results were anticipated to reveal the factors that would affect how quickly and easily the appropriate object could be found and purchased at the proper time and price. The collection of data is anticipated to show how critical it is for the delivery of patient care to match the pace of</p>	<p>Patients and customers want less painful surgery and quick recovery times from the healthcare organisation in addition to quality, safety, and pricing transparency. However, they led to the high cost of treatment as a consequence of the high cost of purchasing</p>

			<p>the procurement work process with the development of medical equipment.</p>	<p>these advanced medical gadgets to match the demand for quality healthcare services. In order to implement procurement innovation, subsequent research employing the TOE framework should take the aforementioned factor into account.</p>
South Korea	resource-based view		<p>The association between IT capabilities and company performance is greater when additional resources, including the kind of e-procurement system, are taken into account. Collaboration capacity had a stronger impact on financial performance when e-procurement had a low information sharing activity and a significant market-making function. Contrarily, the dynamic capability demonstrates a stronger impact on financial performance when an electronic</p>	<p>Alternative measures must be developed in a subsequent research to compensate for cognitive measurement flaws or to support result interpretations by include qualitative data in the analysis. Finally, this research breaks down and examines e-procurement features into four categories.</p>

			procurement system has less search features.	
		1	<p>The results show that a rise in Internet usage throughout the buying process is caused by the novelty of the service for the organisation, pressure from time restrictions to make a service-purchase choice, and people' own interest in a service-purchase decision. Additionally, the findings indicate that the extent of Internet tool usage in service procurement is significantly influenced by the purchasing phase.</p> <p>Businesses must use the advantages the Internet offers as a conduit for distribution and</p>	

		<p>communication when buying services. Businesses that conduct online service sales should pay close attention to the layout of their websites.</p>	
Sweden		<p>Ninety requests for proposals for eleven different kinds of HWT were eligible for consideration and might result in contracts totaling 246 to 292 million euros. 16 tender requests totaling 183 million euros in prospective contracts utilised criteria demanding proof of efficacy. Eight of the requests made reference to a recognised independent standard, such as the CE standard of</p>	

			<p>conformity, MDR, or MDD, to validate the evidence. This predominance seems to apply to all different sorts of procurement entities including HWT. The use of any evidentiary criterion or the absence of such criteria does not seem to have an impact on the results of the bidding process.</p>	
Norway		1	<p>Findings show that the dialectic is truly complementary, making syntheses conceivable since both the thesis and the antithesis are required to produce a combined result that satisfies both.</p>	

CHAPTER THREE

RESEARCH METHODOLOGY AND PROFILE OF ORGANISATION

3.0 Introduction

This chapter describes the research methodologies that were employed to carry out the investigation. It describes the study's research design, the study's population, the sampling and sampling procedure employed, and the data gathering method. It goes on to examine additional topics such as the study's data's reliability and validity, data analysis, and ethical consideration.

3.1 Research Design

The researcher employed a quantitative-descriptive research strategy that was deemed suitable for addressing the study objectives and research questions. The investigation pertaining to the quantitative methodology involved an examination of the trends present in numerical data, which underwent scrutiny through the application of statistical, mathematical, and numerical techniques (Guest, Namey, and Chen, 2020). The study centered on the effectiveness of public procurement and, as such, employed a quantitative research approach. The utilization of quantitative research methodologies was motivated by the researcher's ability to manipulate variables in order to achieve a specific outcome, as noted by Queirós, Faria, and Almeida (2017). The utilization of questionnaires in data collection necessitated the selection of a quantitative research strategy, as no other approach would have been appropriate for this study.

The study used a descriptive research technique to help the lay audience understand the numerical data (Skulmoski, Hartman, & Krahn, 2007). This method made it easier to analyse

and explain the influence of procurement planning on public procurement performance. Descriptive research approaches, like quantitative research methodologies, have proved valuable in clarifying the occurrence of events as well as the influence of procurement planning and public procurement effectiveness on procurement performance. The descriptive research approach, as per Simon et al. (2015), primarily addresses inquiries pertaining to the "what" category. The study employed a combination of postpositivist and positivist research approaches in its methodology. According to Levers (2013), the postpositivist paradigm is characterized by an epistemology that is objectivist and an ontology that is critical realist. The concept of critical thinking entails the necessity for rigor, precision, logical reasoning, and careful consideration of evidence, akin to the principles of positivism. However, unlike post-positivism, critical thinking does not limit itself to the realm of observable phenomena (Crossan, 2003).

Schell (1992) divides research purposes into three categories: exploratory, descriptive, and explanatory. The major purpose of the exploratory research design, according to Mbaka and ISIRAMEN (2021), is to find ideas and insights relevant to a certain phenomena or situation. Descriptive studies, on the other hand, focus on concise descriptions of events, conditions, persons, or connections between elements. Explanatory research's objective is to confirm hypotheses by identifying causal links between variables (Dogan and Turkekul, 2016). Klenke (2016) highlighted many study strategies that researchers typically use while conducting research projects. Case studies, surveys, experiments, action research, archival research, grounded theory, and ethnography are examples. A survey technique will be used as the research methodology. The use of survey technique permitted the effective collecting of a large amount of information from the target population in order to address the study objectives (Denscombe, 2017).

3.2 Population of the Study

Van Ham and Feijten (2008) define a study's population as "the entire population of individuals or products that possess the specific characteristics that are being investigated." Asiamah et al. (2017) discovered that the word "population" may refer to any group of people who share one or more qualities that are important to the researcher. Furthermore, the author proposes that a population might be made up of people who belong to a certain group category or a small subset of a broader group. To generate a representative sample from a particular population, it is necessary to have an accurate enumeration of the people that comprise this population, as well as an understanding of how these individuals might be classified into various subgroups. According to Robinson (2014), the target population or universe is the demographic that has the most relevance for the researcher. The study looked at the functioning of a manufacturing company in Ghana.

3.3 Sample and Sampling Techniques

This section is divided into two the sample size and sample techniques of the study as illustrated below.

3.3.1 Sample Size

Researchers use sampling, a statistical technique, to choose a portion of an interest population—commonly referred to as a "sample." The purpose of this method is to facilitate observations and statistical inferences about the population in question (Onwuegbuzie and Collins, 2007). As a result of practical and financial limitations, conducting research on an entire population can be exceedingly challenging. Therefore, it is recommended or rational to opt for a sample that accurately reflects the population for the purpose of observation and drawing conclusions (Oribhabor and Anyanwu, 2019). According to Saunders et al. (2018),

there is a lack of established guidelines for the selection of an optimal sample for a given research study. It is advisable to employ substantial sample sizes, particularly in the context of multiple regression analysis, where an optimal sample size of 50 to 100 is deemed appropriate (Knofczynski, 2017). The fundamental reason for picking a sample size that correctly reflected or represented the population was to make it easier for the researcher to generalise findings and inferences gained from the sample to the population of interest (Suresh and Chandrashekara, 2012). The sample size for the research was 150 people chosen from the company that was sampled.

3.3.2 Sampling Technique

When choosing a sample for a study, researchers have recourse to a number of sampling approaches. The classification of sampling methods is divided into two basic categories: probability (random) sampling and non-probability sampling (Sharma, 2017). Purposive and convenience sampling approaches were used to choose research respondents from manufacturing organisations. Purposive sampling, also known as judgement sampling, is based on the purposeful selection of participants based on specified attributes or features (Etikan, Musa, and Alkassim, 2016). The study utilized a purposeful sampling technique in order to concentrate on and identify the appropriate manufacturing firm that could furnish pertinent data to aid in accomplishing the research objectives. Additionally, the researchers employed convenience sampling as the method for selecting participants from the manufacturing company. The research study exclusively recruited personnel who held significant positions and demonstrated alignment with the supply chain and procurement functions of the organization, owing to their specialized knowledge and experience.

3.4 Data and Data Collection

The section is divided into variable description, measurement, and data collection instruments, which are illustrated below.

3.4.1 Variables Description and Measurement

Measures that were used in gathering data to address the research objectives was adopted from existing literature. The questionnaire was closed ended and was used in soliciting responses from the study respondents. The questionnaire was structured in way that will enable easy understanding by respondents so that reliable responses can be provided. The questionnaire was structured on a 5-point likert scale and the measurement will range from strongly disagree to strongly agree. The measurement scale will constitute the following; “1 = strongly disagree”, “2 = disagree”, “3 = neutral”, “4 = agree” and “5 = strongly agree”.

Table 3.1 Research Variables and Sources

Variable	Measurement	Items	Reference
Information Technology	IT 1	8	Center and Basel, (2006)
	IT 2		Kiragu, (2012)
	IT 3		Fasanghari, (2008)
	IT 4		Rodríguez-Escobar, and González-Benito, (2015)
Procurement Planning	PLAN 1	8	
	PLAN 2		Kiage, (2013)
	PLAN 3		Salim and Kitheka, (2019)
	PLAN 4		

	PM 1		Rodríguez-Escobar, and
	PM 2		González-Benito, (2015)
Procurement Performance		8	Kiage, (2013)
	PM 3		Kamotho, (2014)

3.4.2 Data Collection Instruments

As a data gathering technique, a questionnaire was used. The survey instrument was designed with the goal of gathering feedback from Ghacem employees. Every questionnaire collection includes both closed-ended and open-ended items. The questionnaire's constructs were developed from existing literature. A 5-point Likert scale was used to grade the survey replies. Participants were asked to rate their degree of agreement with the things on the list. Within the Ghanaian context, these structures conformed to information technology and procurement performance criteria. Section A concentrated on the target population's demographic characteristics, which included factors such as gender, age, educational institution, highest acquired degree of education, and years of professional experience. Section B was all on IT and consisted of eight closed-ended questions. Section C was on procurement planning and included eight closed-ended questions. Finally, Section D focused on procurement performance and had eight closed-ended questions.

3.5 Data Analysis Method

The quantitative aspect of the study design demanded a quantitative analysis, which involved coding the obtained data before transferring it to SPSS for analysis. The data from the research was analysed using both descriptive and inferential statistical approaches. Descriptive statistics were used to investigate the demographic features of the participants as

well as the average rating of all the factors measured. Following that, the data analysis technique included consolidating the acquired data, structuring it logically, and organising its main components in a way that permits clear and effective distribution of the results. The statistical analysis was carried out using the Statistical Package for Social Scientists (SPSS) version 21 software. Data analysis was carried out using descriptive statistics. Descriptive metrics such as means, frequencies, and standard deviations were used in the statistical analysis.

Furthermore, the field of inferential statistics includes the use of correlation and regression methods. Correlation analysis reveals connections between variables, while regression analysis reveals causal links between variables. To investigate the causal influence of the independent factors on the dependent variables, regression models were used. Pearson correlations were used to identify the links between the models, and p and t values were used to determine the causal linkages between the variables. In the end, the Andrews-Hayes model was used in the research to determine the mediating role of procurement planning in connection to IT and procurement performance.

3.6 Validity and Reliability of Constructs/Variables

Internal and external validity must be taken into account when determining the legality of a research study or technique (Eggel and Würbel, 2021). Radhakrishna (2007) claims that internal validity is related to the level of certainty. According to Polit and Beck (2010), the idea of external validity refers to how much the research's results may be trusted and used in contexts, locations, and time periods other than the one in which they were performed. The creation of a representative sample is one of the main ways to achieve the fundamental objective of research, which is to seek external validity (Li et al., 2022). In order to ensure

external validity, the current research used a representative sample of the population for its questionnaire survey. To get their thoughts on the topic, the respondents were selected based on their knowledge of and experience in a variety of sectors.

The study instrument's reliability was evaluated using the internal consistency method. Polit and Beck (2010) suggest that internal consistency is an appropriate method for assessing the reliability of a questionnaire constructed using an interval or ratio scale. The rationale for adopting this methodology in the present investigation is due to the fact that the questionnaires utilized are designed to evaluate the participants' experiences and perceptions. Regarding the aspect of validity, the utilized research instrument comprised a conventional series of self-administered inquiries that were derived from existing literature. The purpose of this approach was to accurately and effectively assess the intended subject matter or response that the questions were designed to measure. The utilization of factor analysis (FA) was implemented to authenticate the proposed model, with the expectation that all factor loadings would surpass the threshold value of 0.5, as suggested by Treiblmaier and Filzmoser (2010). The validation of the expected categories for each section's items was performed through factor analysis.

The determination of a study's reliability is contingent upon the verification that the techniques employed for data collection have produced uniformity in the research outcomes (Bachiochi and Weiner, 2004). For this reason, the study ensured the data were reliable for analysis. The data underwent an internal consistency test using Cronbach's alpha. A Cronbach's alpha value that approaches 1 is considered to be indicative of data analysis reliability and implies that the study's utilized items exhibit a relatively strong degree of

internal consistency. This facilitates the assessment of the comprehensive dependability and uniformity of the scales incorporated in the survey tool.

3.7 Ethical Consideration

The researcher conscientiously filled out the research ethics form, taking into account the various implications that are linked to research ethics. The school has granted approval for this form. Given that the research required the collecting of particular personal information, the study participants were handled with the proper care in this regard. The research's many justifications, including the nature of the data being gathered, the underlying causes for collecting the data, the intended use of the data, and the study's potential impact on them via the collected data, were adequately explained to the participants. This required the collection of specific personal data. The participants received adequate explanations of the many justifications for the study, including the kind of data being collected, the underlying causes for collecting the data, its planned use, and its possible influence on them based on the data acquired. Throughout the investigation, protocols were used to protect the participants' confidentiality and identity. In addition, those who participated were made aware that taking part in the research was completely voluntary and that they had the choice to quit at any time. Overall, the study followed the 10 ethical guidelines for research that were provided by Bryman et al. (2007).

The study prioritised the dignity of research participants and obtained their complete agreement before beginning the investigation to assure their safety. A number of precautions were taken to ensure the study participants' anonymity, the privacy and confidentiality of the research data, and both. The research made clear its connections and funding sources, abstained from conflicts of interest, and avoided lying or exaggerating its goals and objectives. The study avoided providing any false information or portraying the results of

primary data in a biased manner. Communication about the research was carried out with honesty and openness. The participants in the study received no damage.

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CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

This chapter presents the findings and perspectives from the research on the mediation impact of procurement planning on the link between information technologies and procurement performance in manufacturing organisations. The chapter is divided into eight (8) major parts, as follows: Section 4.1 contains preliminary evidence, Section 4.2 descriptive data, and Section 4.3 the findings of reliability and validity assessments. The results of the influence of information technology on procurement performance are shown in section 4.4; the results of the effect of information technology on procurement planning are presented in section 4.5; and the effect of procurement planning on procurement performance is presented in section 4.6. Finally, Section 4.7 discusses the mediation impact of procurement planning on the link between information technology and procurement. Section 4.8 contains discussions of the results.

4.1 Preliminary Analyses of Data

In order to collect information that might be used to examine the aims of the research, questionnaires were distributed to participants in the Ghacem-Takoradi area. The participants in the research provided a total of 150 questionnaires, all of which were successfully collected from them. After screening and a thorough study, it was determined that the recovered surveys did not have any issues related to them. As a result, each and every questionnaire was used in the data analysis. In order to accomplish the objectives of this study, a wide range of demographic aspects were taken into consideration. They consist of the respondent's gender, age range, education level, length of service to the employer, and position in the organisation. The background information of the organisations that

participated in the research as well as the respondents was gathered in order to make it easier to comprehend the features of the data source.

Table 4.1 Demographics Analysis of Respondents

	Frequency	%
Gender		
Female	46	30.6
Male	104	69.3
Age		
25 years or less	8	5.4
26-35 years	72	48.0
36-45 years	61	40.7
46-55 years	7	4.7
Above 55 years	2	1.3
Education		
Diploma (HND)	13	8.6
First Degree	70	46.6
Masters	57	38.0
PhD	2	1.3
Professional Certificate	2	1.3
SSSCE/WASSCE	6	4.1
Experience		
11-15 years	29	19.3
16-20 years	5	3.3

6-10 years	42	28.0
Less than 5 years	68	45.3
More than 20 years	5	3.3
Position		
Operations Manager	39	26
Procurement Officer	78	52.0
Risk Manager	6	4.0
Supply chain manager	14	9.3
Warehouse Manager	13	8.6

Source: (Field Study, 2022)

The research's demographic composition could be seen in the previously mentioned Table 4.1. The poll was able to determine the gender of the respondents, and the data indicated that 104, or 69.3%, of the respondents were male, while 46, or 30.6%, were female. Furthermore, the age range of individuals who answered was established. The poll found that 48 percent of respondents, or 72 persons, were between the ages of 26 and 35. 61 people responded, accounting for 40.7% of the total; 8 people responded, accounting for 5.4% of the total and were 25 or younger; 7 people responded, accounting for 4.7% of the total and were between the ages of 46 and 55; and 2 people responded, accounting for 1.3% of the total and were beyond the age of 55.

In addition, the research collected data about the respondents' levels of educational attainment as a part of its findings. According to the data, 46.6% of respondents (70 individuals) have at least a bachelor's degree, followed by 38.0% (57 individuals), 8.6% (13 individuals), 4.1% (six individuals), and lastly 2.6% (four individuals) who have PhDs and professional certifications.

The survey also collected information on the respondents' employment history, and the results indicate that the majority of respondents 68, or 45.3% have been with the company for less than five years. 29 respondents, or 19.3%, who have been employed by the company for 11 to 15 years come next. 42 respondents, or 28%, who have been employed by the company for six to ten years come next. Following this are 5 responses, or 3.3%, who have worked for the company.

Data on the respondent's position within the company was acquired at the study project's final stage. The findings indicate that 78 of the respondents either occupy the job of procurement officers or carry out the responsibilities of this position. This is followed by 39, which accounts for 26% of the respondents, followed by 14, which accounts for 9.3% of the respondents and holds the position of supply chain manager or performs this function, followed by 13, which accounts for 8.6% of the respondents and holds the position of warehouse manager or performs this function.

4.2 Descriptive Statistics Results

Employing means and standard deviation values, this section gives the descriptive statistics findings for the numerous variables examined in this research. Among the variables covered are information technology, procurement planning, and procurement performance. Each of these variables has been discussed in detail below.

4.2.1 Information Technology

Descriptive Statistics Result for Information Technology

Items	Mean	Standard Deviation
ITH1	3.43	1.313

ITH2	3.22	1.242
ITH3	3.63	1.266
ITH4	3.32	1.172
ITH5	2.80	1.356
ITH6	2.79	1.249
ITH7	3.31	1.291
ITH8	3.63	1.167

Source: (Field Study, 2022)

The table 4.2 above presents a descriptive analysis with respect to information technology. The study measured information technology using eight items, and the mean and the standard deviation result are as follows: The respondent were not sure the company have the necessary software to make money transfers and payments to suppliers with (mean = 3.43 and standard deviation = 1.313); the respondents were not much sure that the purchasing personnel has advice and support for the use of it at their disposal with (mean = 3.22 and standard deviation = 1.242); majority of the respondent agree that the purchasing department has peripheral equipment for their exclusive use (printers, scanners, etc.) with (mean = 3.63 and standard deviation = 1.266); majority of the respondent were not sure that the company runs an efficient system which helps in Order processing for Purchasing with (mean =3.32 and standard deviation = 1.172).

The results also show that the majority of the respondents were not certain that the company uses an automated system for processing invoices (mean = 2.80 and standard deviation = 0.356); that the majority of the respondents were not certain that the company uses electronic

document interchange (EDI) to speed up document processing (mean = 2.79 and standard deviation = 1.249); and that the majority of the respondents were not certain that the company uses a supplier relationship management system.

4.2.2 Procurement Planning

Table 4.3 Descriptive Statistics Result for Procurement Planning

Items	Mean	Std. Dev
PLAN1	3.54	1.246
PLAN2	3.80	1.226
PLAN3	3.79	1.319
PLAN4	3.59	1.199
PLAN5	3.61	1.079
PLAN6	3.71	.958
PLAN7	3.69	1.075
PLAN8	3.62	1.014

Source: (Field Study, 2022)

An analysis is given in the table 4.3 above that describes procurement planning. The research used eight factors to assess procurement planning. The findings show that most respondents concur that the company actively carried out need identification and prioritisation (mean = 3.54 and standard deviation = 1.246); most respondents also concur that the company's planning is participatory (involving all pertinent parties, including the procurement

department) (mean = 3.80 and standard deviation = 1.226); and most respondents concur that the company adheres to the procurement plan.

The results also show that most respondents agree that the organisation established systems to ensure timely procurements (mean = 3.59 and standard deviation = 1.199); most respondents agree that their organisation, through their procurement department, has established better need evaluation methodologies that enhance efficiency and performance (mean = 3.61 and standard deviation = 1.079); and most respondents agree that their company h Finally, the results show that the majority of respondents concur that the organisation has put in place measures for the procurement department on how it can purchase items using supplementary budgets (mean = 3.62 and standard deviation = 1.014); the majority of respondents concur that the organisation has a clear quarterly budget system in place that improves the organization's ability to achieve value for money.

4.2.3 Procurement Performance

Table 4.4 Descriptive Statistics Result for Procurement Performance

Items	Mean	Std. Dev
PRP1	3.49	1.110
PRP2	3.70	1.163
PRP3	3.52	1.021
PRP4	3.24	1.008
PRP5	3.53	.939
PRP6	3.53	1.091

PRP7	3.59	1.165
PRP8	3.49	1.110

Source: (Field Study, 2022)

An investigation of the descriptive nature of the procurement performance is shown in table 4.4 above. The study used eight items to gauge procurement performance, and the findings showed that most respondents were unsure whether the company records high reliability of purchased products (mean = 3.49 and standard deviation = 1.110); the majority of respondents agree that suppliers always fulfil agreed-upon delivery requirements (quantity, quality, format, etc.); and the majority of respondents agree that there is always full compliance with procurement regulations.

The results also show that the majority of respondents agree that their company has reduced order transmission errors (mean = 3.53 and standard deviation = 0.939), that their company has significantly decreased the time required to complete the procurement process (mean = 3.53 and standard deviation = 1.091), and that their company has demonstrated stronger vendor-buyer relationships (mean = 3.53 and standard deviation = 1.091).

4.3 Reliability and Validity Test

The degree to which the measurement scales may be trusted and regarded legitimate is largely determined by reliability and validity in the framework of research endeavours. The Cronbach Alpha test, which examines the degree of internal consistency of the structures, was used to carry out this. Any construct recording lower than this level indicates that the instrument has poor internal consistency; a Cronbach's alpha test rate of 70%, or 0.7, was regarded acceptable. With the use of factor analysis, the validity of the measurement scale was examined. To do a trustworthy factor analysis, there must be an adequate number of

testable hypotheses. For instance, Bartlett's Test of Sphericity probability has to be statistically significant (p-value 0.05), and Kaiser-Meyer-Oklin (KMO) values need to be at least 0.50 (half) or higher. Additionally, the average variance extracted (AVE) value must be at least 0.5 and the factor loadings of the elements or items under examination must be larger than 0.6. (Hair, 2010). The reliability and validity of each specific concept are examined and presented for your review in the paragraphs that follow.

4.3.1 Validity and reliability results for Information Technology

Table 4.5 EFA on Information Technology

Items	Factor loading
ITH1	0.686
ITH2	0.710
ITH3	0.714
ITH4	0.637
ITH5	0.629
ITH6	0.687
ITH7	0.551
ITH8	0.552
Cronbach Alpha	0.838
Eigenvalue	3.810
% of Variance	57.629
KMO=0.792; $\chi^2=481.180$; df=28; P-value=0.000	

Source: (Field Study, 2022)

Table 4.5 above displays the outcomes of the information technology validity and reliability testing. The Cronbach Alpha test for information technology was conducted, and the findings indicated that Cronbach Alpha = 0.838, that is much higher than the minimum acceptable rate of 70%. The test consisted of eight separate questions, as shown in the table. A factor analysis was performed in order to look into the measurement scale's reliability. The KMO values were 0.792, which is more than 50% (0.50), according to the results of the factor analysis. Bartlett's Test of Sphericity's probability was also significant (p-value = 0.000; 2 = 481.180; df = 38). Additionally, the range of factor loadings for the items was between 0.522 and 0.714, which is bigger than 0.6, and the average variance extracted (AVE) was greater than 0.5.

4.3.2 Validity and reliability results for Procurement Planning

Table 4.6 EFA on Procurement Planning

Items	Factor loading
PLAN1	0.622
PLAN2	0.616
PLAN3	0.734
PLAN4	0.727
PLAN5	0.704
PLAN6	0.645
PLAN7	0.588
PLAN8	0.557

Cronbach Alpha	0.920
Eigenvalue	5.173
% of Variance	64.660
KMO=0.834; $\chi^2=840.103$; df=28; p-value=0.000	

Source: (Field Study, 2022)

The table 4.6 above displays the validity and reliability results for procurement planning. Cronbach Alpha = 0.920, which is much higher than the minimum acceptable rate of 70%, was the outcome of the procurement planning Cronbach Alpha test, which was conducted using eight distinct items as given in the table. A factor analysis was performed in order to examine the measurement scale's reliability. Bartlett's Test of Sphericity's probability was also significant, with a value of $\chi^2 = 840.103$, $df = 28$, and a p-value of 0.000. According to the findings of the factor analysis, the KMO values were 0.834, which is more than 50% (0.50). Additionally, the average variance extracted (AVE) was higher than 0.5, and the factor loadings of the items ranged from 0.557 to 0.734, which is bigger than 0.6. Both of these values are more than 0.6.

4.3.3 Validity and reliability results for Procurement Performance

Table 4.7 EFA on Procurement Performance

Items	Factor loading
PRP1	0.649
PRP2	0.705
PRP3	0.651
PRP4	0.246
PRP5	0.580

PRP6	0.627
PRP7	0.696
PRP8	0.586
Cronbach Alpha	0.899
Eigenvalue	4.470
% of Variance	59.248
KMO=0.892; $\chi^2=665.326$; df=28; p-value=0.000	

Source: (Field Study, 2022)

The table above displays the validity and reliability results for procurement performance. A Cronbach Alpha test for procurement performance was performed, as indicated in the table, and the findings revealed that Cronbach Alpha = 0.899, which is much higher than the minimum acceptable rate of 70%. A factor analysis was performed in order to examine the measurement scale's reliability. Bartlett's Test of Sphericity's probability was also significant, with a value of $\chi^2 = 665.326$, $df = 28$, and a p-value of 0.000. According to the findings of the factor analysis, the KMO values were 0.892, which is more than 50% (0.50). Additionally, the average variance extracted (AVE) was higher than 0.5, and the factor loadings of the items ranged from 0.580 to 0.705, which is bigger than 0.6. Both of these values are more than 0.6.

4.3.4 Correlation Matrix

Table 4.8 Correlations Matrix

	Information Technology	Procurement Planning	Procurement Performance
Information Technology	1		

Procurement Planning	0.708**	1	
	0.000		
Procurement Performance	0.653**	0.838**	1
	0.000	0.000	

Source: (Field Study, 2022)

The research discovered a significant link between information technology and procurement planning ($r = 0.708$, p -value 0.05), as shown in Table 4.8 above. Again, the association between information technology and procurement performance was significant ($r = 0.653$, p -value 0.05), and the link between procurement planning and procurement performance was significant ($r = 0.838$, p -value 0.05).

4.4 Effect of Information Technology on Procurement Performance

Table 4.9 Effect of Information Technology on Procurement Performance

Items	procurement Performance	P-value
	Beta (t-value)	
information technology	0.653 (10.480)	0.000
R	0.653	
R Square	0.426	
F-statistics	109.828	

Note: Authors Construction (2022). Significant level (P -value < 0.05)

As can be seen in Table 4.9, the outcome of the regression estimate revealed that information technology was responsible for 42.6% (R squared = 0.426) of the variability in the performance of the firm's procurement activities. In addition, the findings showed that the use

of information technology had a substantial influence (Beta = 0.653, P-value = 0.000) on the efficiency of the procurement process. Therefore, Hypothesis 1 is completely validated; a unit change in information technology resulted in a 65.3% shift in the performance of procurement.

4.5 Effect of Information Technology on Procurement Planning

Table 4.10 Effect of Information Technology on Procurement Planning

Items	procurement planning	P-lavue
	Beta (t-value)	
information technology	0.700 (12.210)	0.000
R	0.708	
R Square	0.502	
F-statistics	149.076	

Note: Authors Construction (2022). Significant level (P-value < 0.05)

As can be seen in Table 4.10, the outcome of the regression estimate revealed that information technology was responsible for 50.2% (R squared = 0.502) of the variability that was seen in the process of company procurement planning. The findings also showed that the use of information technology had a substantial impact (Beta = 0.700, P-value = 0.000) on the purchasing decision-making process. Therefore, Hypothesis 2 is completely validated; a change of one unit in information technology resulted in a shift of seventy percent in purchase strategy.

4.6 Effect of Procurement Planning on Procurement Performance

Table 4.11 Effect of Procurement Planning on Procurement Performance

Items	procurement planning	P-value
	Beta (t-value)	
information technology	0.838 (18.719)	0.000
R	0.745	
R Square	0.703	
F-statistics	149.076	

Note: Authors Construction (2022). Significant level (P-value < 0.05)

As can be seen in Table 4.11, the outcome of the regression estimate revealed that procurement planning was responsible for 70.3% (R squared = 0.703) of the variability that can be found in the performance of a firm's procurement efforts. The findings also showed that the planning of the procurement process had a substantial influence (Beta = 0.838, P-value = 0.000) on the performance of the procurement process. Therefore, Hypothesis 3 has an abundance of support: a one-unit shift in purchase planning resulted in an 83.8% shift in procurement performance.

4.7 Mediation Effect of Procurement Planning On the Relationship between Information Technology and Procurement

The suggestions made by Fairchild and McDaniel (2017) served as the basis for the mediation analysis that was carried out. The concept of mediation refers to a postulated sequence of events in which one variable has an effect on another variable, which then has an effect on a third variable. The mediator is denoted by the letter M, which denotes the intervening variable. It acts as a "mediator" in the connection that exists between a predictive factor known as X and an outcome. The process of mediation may be represented graphically in the following manner: $X \rightarrow M \rightarrow Y$

Table 4.12 mediation effect of Procurement planning on information technology and procurement

Items	Procurement	Procurement	Procurement	Procurement	P-value
	Performance	Planning	Performance	Performance	
	Step 1	Step 2	Step 3	Step 4	
	Beta (t-value)	Beta (t-value)	Beta (t-value)		
Information Technology	0.653 (10.480)				0.000
Information Technology		0.708 (12.210)			0.000
Procurement Planning			0.838 (18.719)		0.000
Procurement Planning				0.755 (11.997)	0.000
Information Technology				0.118 (1.872)	0.063
R	0.653	0.708	0.838	0.843	
R Square	0.426	0.502	0.703	0.710	
F-statistics	109.828	149.076	350.383	179.910	
ΔR Square	0.426	0.502	0.703	0.696	
ΔF	109.828	149.076	350.383	101.953	

Note: Authors Construction (2022). Significant level (P-value < 0.05)

An investigation into the function that procurement planning plays as a mediatory influence on the connection between information technology and procurement performance was the subject of a mediation study. The findings of the investigation into the role that procurement

planning plays as a mediator in the connection that exists between information technology and procurement performance are shown in Table 4.12. According to the findings of the research, information technology was a significant factor in predicting (Beta = 0.653, T-value = 10.480, and p-value = 0.05) procurement performance. The influence of information technology on procurement performance was rendered inconsequential with the inclusion of the mediating variable, which was procurement planning (Beta = 0.118, T-value = 1.872, P-value = 0.063). It was discovered that the indirect impact of information technology on procurement performance was substantial (Beta = 0.755, T-value = 11.997, and p-value = 0.05). This effect was observed to occur via procurement planning. This demonstrates that the role of procurement planning as a mediator in the interaction between information technology and procurement performance is complete. As a result, the H4 has comprehensive support.

4.8 Discussions of Findings

4.8.1 Effect of Information Technology on Procurement Performance

In accordance with the results of current study, information technology was in charge of 42.6% (R squared = 0.426) of the variation in the company's procurement operations' efficiency. The information also showed that the effectiveness of the procurement process is significantly impacted by the usage of information and communication technologies. Hypothesis 1 has been completely validated since an increase in units in information technology did cause a 65.3% change in the performance of procurement. The outcome is supported by the available empirical evidence. Information and communication technology are shown to have statistical significance in Cheptora, Osoro, and Musau's (2018) investigation of the variables that influence procurement success in manufacturing enterprises. Rodriguez-Escobar and González-Benito (2015) look at how information technology may assist explain buying function performance despite the fact that investments in IT have a favourable impact on the purchasing function. They show that while information

technology expenditures have a favourable impact on the buying function, this impact only occurs when purchasing practises are implemented that enhance the purchasing function's performance.

Quesada et al. (2010) investigate the impact of electronic procurement technologies on procurement practises and performance. The results show that the usage of e-procurement technology improves managers' perceptions of both procurement practises and procurement performance. Even in situations when managers aren't directly engaged, this is the case. Similar to this, Khan and Qianli (2017) show that the adoption of information technology has an impact that might be deemed of statistical significance on the performance of enterprises. According to Mithas and Rust's (2016) research, companies that place a dual emphasis on information technology have greater market values as determined by Tobin's Q than companies that place a focus on revenue or cost, but they also have equal levels of profitability. This is due to the greater mean value of information technology expenditures made by businesses with a dual focus on information technology. Additionally, Mikalef and Pateli (2017) suggest that two distinct types of agility are possible with IT-enabled dynamic capabilities: market capitalization agility and operational adjustment agility. A rise in competitive performance is facilitated by both of these types of agility. Not least, Kiragu (2012) assesses the impact that information technology has had on the process of buying products and services. According to him, practical structures and suitable tools must be created if buying organisations are to operate effectively and efficiently in such a complicated environment. Utilising information and communication technology could prove very important in this regard. When implemented correctly, it has the potential to provide a more streamlined and expedient flow of processes, more efficient dissemination of information, decentralisation of duties and choices, more transparency, and improved control.

Additionally, information technology is helpful not only in the support of internal procedures but also in the support of activities that involve business partners.

4.8.2 Effect of Information Technology on Procurement Planning

According to the findings of the current research, information technology was to blame for 50.2% ($R^2 = 0.502$) of the variation that was seen in the procedure of firm procurement planning. The findings also revealed that the use of information technology in the purchasing decision-making process had a significant impact in this regard. As a consequence, Hypothesis 2 has been totally supported; a shift in purchase planning of 70% was caused by a change of one unit in information technology. The outcome was supported by the available empirical evidence. Information technology was shown to have an effect on the execution of procurement plans after being investigated by Nyaga and Kihara (2017), who investigated the elements that influence the implementation of procurement plans. They demonstrated that the lack of proper implementation of procurement planning has a variety of implications for the organisation that may impede its progress. One of the paths that the organisation should take is to incorporate information technology into the process of their procurement planning. In order to ascertain how information technology affected the process of buying products and services, Kiragu (2012) performed an analysis. He came to the conclusion that collaboration between organisations that keep data and those that utilise the data is necessary for the use of technology to enhance the purchase process.

The way work is done in addition to the structure, quantity of individuals, abilities sets of acquiring staff, and corporate structure of the purchasing unit will change as a result of the incorporation of data technology into procurement procedures (Vaidya, Sajeev, and Callender, 2006). A company's performance may be significantly impacted by the procurement department's performance (Masudin et al., 2021; Muriuki, 2021; and Okinyi and

Muturi, 2016). The market's megatrends, however, have an impact on it since it is a basic process. Its daily operations are heavily influenced by rising procurement volumes, which come about as a consequence of a greater corporate focus on core competencies, globalisation of the procurement markets, evolving market dynamics, and a decreasing average product lifespan. The design and implementation of workable structures as well as the usage of suitable tools are required for a procurement organisation to operate successfully and efficiently in such a complex environment. In this regard, the employment of communication and information technology may be crucial.

4.8.3 Effect of Procurement Planning on Procurement Performance

According to the findings of this particular research, the variability in the effectiveness of a company's procurement efforts may be attributed, in total, to 70.3% ($R^2 = 0.703$) of the planning that goes into the procurement process. In addition, the data demonstrated that the planning phase of the procurement process had a considerable impact on the way in which the procedure was carried out. Therefore, there is a lot of evidence to back up Hypothesis 3: a one-unit change in buy planning led to an 83.8% change in procurement performance. The outcome was supported by the available empirical evidence Onyango (2014) looked at how procurement planning affected the performance of public institutions with a focus on goals, cost projections, need assessments, and quality requirements. He found that there was a statistically significant correlation between performance and procurement planning. Additionally, Willy and Njeru (2014) look at how logistics management affects procurement performance, the consequences of following procurement plans, and the impact of procurement portfolio management. They discovered through their analysis that there is a strong relationship between strategic procurement planning and performance.

The results of Salim and Kitheka's (2019) examination into the connections between procurement planning and procurement performance show that planning has a significant influence on performance. Nonetheless, Odero and Ayub (2017) looked examined how procurement practises affected the performance of publicly traded sugar production enterprises. According to their research, staff competency had a strong positive and significant influence on procurement performance, while procurement planning had a favourable but little impact. In their 2017 study, Nyaga and Kihara look at how procurement planning affects an organization's performance. They find that procurement plays a significant role and that every organisation should develop efficient procurement systems to preserve the money of shareholders. The fact that procurement involves the use of public funds or taxpayer money that needs to be properly accounted for makes it extremely significant. For this reason, the procurement function forms a key part of management strategy. Procurement is important because it involves the use of public funds or taxpayer money (Munzhedzi, 2016). The specific aspects of procurement include the funds that are involved, the frequency of activities, and the level of technical sophistication that is engaged in the functions. Therefore, the activity of procurement has to be seen as an internal component of the process of business planning and needs to have a connection to the strategy for asset management.

4.8.4 Mediation Effect of Procurement Planning On the Relationship between Information Technology and Procurement

In order to understand how information technology and procurement performance are related, this research looks at the function that procurement planning performs as a mediator. This research specifically focuses on how procurement planning affects the choice of information technologies that are used. The utilisation of information technology was significant in predicting procurement performance, according the study's findings (Beta = 0.653, T-value =

10.480, p -value = 0.05). The influence of information technology on procurement performance was rendered inconsequential (Beta = 0.118, T-value = 1.872, P-value = 0.063) as a result of the procurement planning mediating variable's inclusion. Beta = 0.755, T-value = 11.997, and p -value = 0.05 shown that information technology had a significant indirect impact on the effectiveness of the procurement process. During the planning phase of the procurement process, this influence was seen. This demonstrates that the role of procurement planning as a mediator between information technology and procurement performance is complete and that it has been successfully performed. This directly results in broad support for the H4. The conclusion was supported by the empirical evidence. In their 2015 study, Rodriguez-Escobar and González-Benito explore how information technology might provide light on the processes involved in making purchases. As a mediator in the relationship between information technology and purchasing performance, buying practises were also examined in addition to the direct effect. The results show that although information technology expenditures have a positive effect on the buying function, this impact is caused by the use of purchasing practises that, in turn, improve the purchasing function's results. González-Benito's (2007) study looked at the relationship between spending on information technology and how the purchasing function functions. This study looks at not only if there is a link, but also how it functions in buying practises and how purchasing is strategically included as a mediator between the two. The results show that the procurement department's operational performance is positively impacted by investments in information technology. Despite this, the results show that this effect happens because information technology enables businesses to implement specific purchasing practises and, in part, because it enables greater strategic integration of the purchasing function.

Using information obtained from Industry Week's Census of Manufacturers, Ward and Zhou (2006) conduct an empirical investigation of the links between interfirm and intrafirm information technology integration, lean and JIT strategies, and lead-time performance. To

begin, the findings of the research show that the lead time may be greatly reduced by using lean and JIT practices. Second, the use of lean and JIT practises helps to moderate the effect that the integration of information technology has on lead-time performance. This shows that the process improvements that arise from adopting lean and JIT practises are significant contributors to the success of integrating information technology. The placement of information technology in regard to the various elements of a strategic buyer-supplier relationship, as well as the operational and managerial behaviours of the various participants, are discussed by Makkonen and Vuori (2014). The research demonstrates how information technology affects the relationship's structural, operational, and managerial levels. In order to increase the consistency and performance of the relationship, it also shows how information technology may be a potent tool around which relationship management activities can be performed. Additionally, Zeng and Lu (2020) look at how the performance of agri-food supply chains is impacted by IT capabilities. This article's specific goal is to investigate the direct and indirect effects of inter-organizational links on agri-food SCP that information technology skills have. The research's conclusions indicate that the capabilities of information technology have a significant direct impact on the agri-food SCP and that these capabilities also strengthen the interorganizational relationships that already exist there. Furthermore, the agri-food supply chain process benefits from relationships across organisations. The indirect impact of information technology significant skills on the performance of the agri-food supply chain is moderated by inter-organizational relationships, a component of the information route. The last but not least important element is this. Liu et al. (2013) study how a company's performance is impacted by the abilities of information technology (i.e., flexible IT infrastructure and IT assimilation) via supply chain agility and absorptive capacity. The findings show that supply chain agility and absorptive ability completely mitigate the effects of information technology skills on company performance. In addition to these direct effects, absorptive capacity also affects the supply chain's agility,

which has indirect effects on the company's performance. The strategic character of the buying function and the transformational leadership of purchasing managers are examined by Camarero Izquierdo and her coworkers (2015) in relation to how these factors affect the frequency and effectiveness of information technology usage. The usage of information technology and purchase performance are their second main focus. The results show that the management's degree of strategic relevance for the purchasing function has an impact on the degree in which information technology is deployed. Nonetheless, the transformative leadership demonstrated by purchasing managers is significant in the achievement of increased cost efficiency and supplier collaboration.



CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

The goal of this chapter is to present a succinct review of the study's results in connection to the set goals, as well as the conclusion, recommendations, and future research proposals. The research's objective was to look at how procurement planning affects the link between information technology and procurement performance. The study's findings serve as the basis for the conclusion, recommendations, and future research directions.

5.1 Summary of Findings

The following section offers a summary of the study's findings in relation to the goals it sought to accomplish. The study largely addressed four questions: What is the influence of information technology on procurement performance in manufacturing firms? What impact does information technology have on procurement planning in the setting of industrial firms? What is the relationship between procurement planning and procurement performance in Ghanaian manufacturing firms? How well does procurement planning moderate the link between information technology and procurement performance in Ghanaian manufacturing firms? The major goal of the study was to investigate the influence of information technology on procurement performance in Ghanaian manufacturing enterprises. The research also tried to investigate the possible moderating function of procurement planning in this connection. A census survey method was used to collect data from 150 people for the research. The study's target demographic was Ghanaian industrial enterprises, from whom data was acquired. The primary data was gathered using a structured questionnaire as the major research technique. This study's research approach included using a correlation and regression strategy to analyse

the obtained data and evaluate the presented research hypotheses. The main findings of the research are detailed in sections 5.1.1 to 5.1.4.

5.1.1 The effect of information technology on procurement Performance

According to the study, information technology was responsible for 42.6% ($R^2 = 0.426$) of the variability in the company's procurement efficiency. The results reveal that the use of information and communication technologies has a significant impact on procurement performance. According to the findings, a little increase in the use of information technology results in a significant 65.3% change in procurement efficiency. The major goal of this research was to examine the influence of information technology on procurement performance in Ghanaian manufacturing enterprises. This study's results have satisfactorily addressed this objective.

5.1.2 The impact of Information technology on procurement planning

According to the study's results, information technology accounted for 50.2% ($R^2 = 0.502$) of the observed variation in the procurement planning process among organisations. According to the study's conclusions, the introduction of information technology had a significant influence on procurement planning. As a result, Hypothesis 2 is completely supported. The second goal of the research was to investigate the impact of information technology on procurement planning in Ghanaian manufacturing enterprises, and this goal was met.

5.1.3 The impact of Procurement planning on procurement Performance

According to the data, procurement planning accounts for roughly 70.3% ($R^2 = 0.703$) of the variation in the organization's procurement performance. Furthermore, the data show

that procurement planning has a significant impact on procurement performance, with a single change in procurement planning leading in an 83.8% change in procurement performance. The examination of the impact of procurement planning on procurement performance in Ghanaian manufacturing enterprises has been addressed.

5.1.4 The mediation effect of Procurement planning on information technology and procurement Performance

The study's results show that information technology may strongly predict procurement performance (beta = 0.653, T-value = 10.480, and p-value = 0.05). When the mediating variable, procurement planning, was included, the influence of information technology on procurement performance was eliminated (Beta = 0.118, T-value = 1.872, P-value = 0.063). The research found that information technology had a significant indirect influence on procurement performance (beta = 0.755, T-value = 11.997, and p-value = 0.05). According to the study's results, procurement planning acts as a moderator in the link between information technology and procurement performance. The third goal of the research was to assess the role of procurement planning in mediating the relationship between information technology and procurement. The problem of high-performance manufacturing companies has been addressed.

5.2 Conclusion

Through a quantitative research technique and a structured questionnaire, this study intends to investigate the mediating function of procurement planning in the relationship between information technologies and procurement performance. According to the results, the use of information and communication technologies has a significant impact on procurement performance. The results reveal that the use of information technology has a significant

impact on the procurement planning process. According to the data, procurement planning has a significant impact on procurement performance. According to the study's results, there is evidence of procurement planning mediation in the link between information technology and procurement performance.

5.3. Policy Implications and Recommendations

5.3.1 Policy Implications

The study's conclusions have important implications for policy creation in both commercial and governmental enterprises. The results show a considerable relationship between procurement planning and the influence of information technologies (IT) on procurement performance, with the latter serving as a mediator. This underscores the need of policy initiatives targeted at promoting IT adoption as well as procurement planning. This research emphasises the need of incorporating information technology into procurement operations. As a result, policymakers must consider the creation and execution of information technology procurement regulations that enable the use of digital instruments in procurement. Implementing this method may help organisations save costs, develop pleasant supplier connections, improve adherence to contractual duties, and ultimately improve procurement effectiveness. The study's findings indicate the need for governmental initiatives that enable effective procurement planning. The data imply that procurement planning has a key role in mediating the relationship between IT and procurement performance. As a result, strategies to promote the use of strategic procurement planning techniques are advocated. The preceding may include guidelines relating to suitable market research, supplier selection, procurement scheduling, and risk management.

5.3.2 Recommendations

Drawing from the results obtained, a number of suggestions can be made. It is recommended that organizations allocate resources towards contemporary information technology infrastructure capable of facilitating digital procurement procedures. Acquiring software for procurement management, data analysis, and supplier relationship management may be encompassed in this process. It is recommended that organizations allocate resources towards the ongoing education and development of their procurement staff, with a focus on improving their proficiency in information technology and their comprehension of strategic procurement planning. The attainment of this objective can be facilitated by means of internal training, workshops, seminars, and advanced education. In addition, it is imperative to establish and execute unambiguous protocols that facilitate the utilization of information technology in procurement and foster proficient procurement strategizing. It is imperative to conduct periodic evaluations and revisions of these policies in order to remain current with technological advancements. It is recommended that organizations contemplate the establishment of a specialized team that is accountable for the planning of procurement. The team in question would establish a close collaboration with the IT department to guarantee the optimal utilization of information technology in the context of procurement planning. Lastly, it is recommended to carry out periodic assessments and evaluations to gauge the efficacy of IT and procurement planning in enhancing procurement performance. This has the potential to offer significant insights for the formulation of future policies and the development of strategies.

5.4 Suggestions for further research

The study's results offer significant perspectives on the intermediary role of procurement planning in the correlation between information technologies (IT) and procurement

performance. Nonetheless, there exist various avenues for additional investigation that could enhance our comprehension of this correlation and its ramifications. Several potential areas for further exploration have been proposed, including:

The research centered on examining the intermediary function of procurement planning in the correlation between information technology (IT) and procurement performance. Subsequent investigations may delve into alternative mediating variables, including but not limited to supplier relationship management, risk management, or procurement innovation. This would facilitate a more comprehensive comprehension of the factors that impact procurement performance. Further investigations could be conducted in future research to examine potential moderating variables, including but not limited to organizational culture, leadership style, or market conditions, in addition to mediating variables. The identification of moderating variables has the potential to assist organizations in customizing their procurement strategies to more effectively align with their unique contextual circumstances.

The present research offers significant contributions by shedding light on the intermediary role of procurement planning in the association between information technology and procurement performance. Nevertheless, additional research could examine this correlation across diverse sectors and geographical locations. Conducting comparative studies may facilitate the identification of industry-specific or regional patterns that could impact the interplay between information technology, procurement planning, and procurement performance.

The present investigation employed a cross-sectional research methodology to explore the mediating impact of procurement planning. Longitudinal investigations have the potential to

offer valuable insights into the progression of this association over an extended period as well as uncover the ways in which procurement planning and IT adoption may impact procurement performance in the future.

The consideration of sustainability is progressively gaining significance in the process of making procurement decisions. Potential avenues for future research could involve investigating the extent to which sustainability factors influence the interplay between information technology, procurement planning, and procurement performance. This could potentially assist organizations in formulating procurement strategies that are congruent with their sustainability objectives and facilitate sustained prosperity.



REFERENCES

- Adusei, C. and Awunyo-Vitor, D., (2015). Implementation challenges of the public procurement act by selected metropolitan, municipal and district assemblies in the Ashanti Region, Ghana. *iBusiness*, 7(01), p.39.
- Afolabi, A., Ibem, E., Aduwo, E. and Tunji-Olayeni, P., (2022). Digitizing the grey areas in the Nigerian public procurement system using e-Procurement technologies. *International Journal of Construction Management*, 22(12), pp.2215-2224.
- Agarchand, N. and Laishram, B., (2017). Sustainable infrastructure development challenges through PPP procurement process: Indian perspective. *International Journal of Managing Projects in Business*, 10(3), pp.642-662.
- Akbar, Y.H. and Tracogna, A., (2018). The sharing economy and the future of the hotel industry: Transaction cost theory and platform economics. *International Journal of Hospitality Management*, 71, pp.91-101.
- Amemba, C.S., Nyaboke, P.G., Osoro, A. and Mburu, N., (2013). Challenges affecting public procurement performance process in Kenya. *International Journal of Research in Management*, 3(4), pp.41-55.
- ANSAH, J. and NORMANYO, S., (2017) Decentralised Departments of Governance in Line with the Procurement Act 2003,(Act 663) of Ghana: The Case of Metropolitan, Municipal and District Assemblies (MMDAS) in the Western Region of Ghana.
- Asakeya, G.K., (2014). Impact of procurement planning within Ghana Health Service: a study of Ridge Hospital-Accra (Doctoral dissertation).
- Bachiochi, P.D. and Weiner, S.P., (2004). Qualitative data collection and analysis. *Handbook of research methods in industrial and organizational psychology*, pp.161-183.

Bag, S., Wood, L.C., Mangla, S.K. and Luthra, S., (2020). Procurement 4.0 and its implications on business process performance in a circular economy. *Resources, conservation and recycling*, 152, p.104502.

Barsemoi, H., Mwangagi, P. and Asienyo, B.O., (2014). Factors influencing procurement performance in private sector in Kenya. *International Journal of Innovation and Applied Studies*, 9(2), p.632.

Bienhaus, F. and Haddud, A., (2018). Procurement 4.0: factors influencing the digitisation of procurement and supply chains. *Business Process Management Journal*.

Brandon-Jones, A. and Kauppi, K., (2018). Examining the antecedents of the technology acceptance model within e-procurement. *International journal of operations & production management*.

Busse, C., (2016). Doing well by doing good? The self-interest of buying firms and sustainable supply chain management. *Journal of Supply Chain Management*, 52(2), pp.28-47.

Carr, A.S. and Smeltzer, L.R., (2002). The relationship between information technology use and buyer-supplier relationships: an exploratory analysis of the buying firm's perspective. *IEEE Transactions on engineering management*, 49(3), pp.293-304.

Center, C. and Basel, E.B., (2006). The role of information technology in procurement in the Top 200 companies in Switzerland.

Chang, H.H. and Wong, K.H., (2010). Adoption of e-procurement and participation of e-marketplace on firm performance: Trust as a moderator. *Information & management*, 47(5-6), pp.262-270.

Chebets, J. and Kihara, A., (2022). Influence of E-Procurement on Procurement Performance in Manufacturing Firms in Nairobi County. *International Journal of Social Sciences Management and Entrepreneurship (IJSSME)*, 6(1).

Cheptora, N.C., Osoro, A. and Musau, E.G., (2018). The impact of information and communication technology on procurement performance in manufacturing firms in Kenya. *International journal of academic research in business and social sciences*, 8(9), pp.605-616.

Cheptora, N.C., Osoro, A. and Musau, E.G., (2018). The impact of information and communication technology on procurement performance in manufacturing firms in Kenya. *International journal of academic research in business and social sciences*, 8(9), pp.605-616.

Christensen, I. and Karlsson, C., (2019). Open innovation and the effects of crowdsourcing in a pharma ecosystem. *Journal of Innovation & Knowledge*, 4(4), pp.240-247.

Cichosz, M., Wallenburg, C.M. and Knemeyer, A.M., (2020). Digital transformation at logistics service providers: barriers, success factors and leading practices. *The International Journal of Logistics Management*, 31(2), pp.209-238.

Cole, R., Stevenson, M. and Aitken, J., (2019). Blockchain technology: implications for operations and supply chain management. *Supply Chain Management: An International Journal*, 24(4), pp.469-483.

Corboş, R.A., Bunea, O.I. and Jiroveanu, D.C., (2023). The Effects of Strategic Procurement 4.0 Performance on Organizational Competitiveness in the Circular Economy. *Logistics*, 7(1), p.13.

Coulthard, D. and Castleman, T., (2001). Electronic procurement in government: More complicated than just good business. *ECIS 2001 Proceedings*, p.34.

Croom, S. and Brandon-Jones, A., (2007). Impact of e-procurement: experiences from implementation in the UK public sector. *Journal of Purchasing and Supply management*, 13(4), pp.294-303.

- Croom, S. and Brandon-Jones, A., (2007). Impact of e-procurement: experiences from implementation in the UK public sector. *Journal of Purchasing and Supply management*, 13(4), pp.294-303.
- Crossan, F., (2003). Research philosophy: towards an understanding. *Nurse Researcher (through 2013)*, 11(1), p.46.
- De Vries, J. and Huijsman, R., (2011). Supply chain management in health services: an overview. *Supply chain management: An international journal*.
- Denscombe, M., (2017). EBOOK: The good research guide: For small-scale social research projects. McGraw-Hill Education (UK).
- Dey, P.K., Bhattacharya, A., Ho, W. and Clegg, B., (2015). Strategic supplier performance evaluation: A case-based action research of a UK manufacturing organisation. *International Journal of Production Economics*, 166, pp.192-214.
- Dixit, A.R., Gupta, M. and Narain, R., (2009). Role of information technology in E-procurement. In Conference Paper Presented at the National Seminar on Recent Advances on Information Technology, at ISM Dhanbad.
- Dogan, E. and Turkekul, B., (2016). CO 2 emissions, real output, energy consumption, trade, urbanization and financial development: testing the EKC hypothesis for the USA. *Environmental Science and Pollution Research*, 23, pp.1203-1213.
- Edler, J. and Yeow, J., (2016). Connecting demand and supply: The role of intermediation in public procurement of innovation. *Research Policy*, 45(2), pp.414-426.
- Eggel, M. and Würbel, H., (2021). Internal consistency and compatibility of the 3Rs and 3Vs principles for project evaluation of animal research. *Laboratory animals*, 55(3), pp.233-243.
- Etikan, I., Musa, S.A. and Alkassim, R.S., (2016). Comparison of convenience sampling and purposive sampling. *American journal of theoretical and applied statistics*, 5(1), pp.1-4.

Faccia, A. and Petratos, P., (2021). Blockchain, enterprise resource planning (ERP) and accounting information systems (AIS): Research on e-procurement and system integration. *Applied Sciences*, 11(15), p.6792.

Fasanghari, M., (2008), August. Assessing the impact of information technology on supply chain management. In *2008 International Symposium on Electronic Commerce and Security* (pp. 726-730). IEEE.

Fekpe, E.S. and Fiagbey, M.E., (2021). Information technology deployment and supply chain performance: Evidence from emerging economy. *Journal of the Academy of Business and Emerging Markets*, 1(1), pp.19-32.

Foerstl, K., Hartmann, E., Wynstra, F. and Moser, R., (2013). Cross-functional integration and functional coordination in purchasing and supply management: Antecedents and effects on purchasing and firm performance. *International Journal of Operations & Production Management*, 33(6), pp.689-721.

Guest, G., Namey, E. and Chen, M., (2020). A simple method to assess and report thematic saturation in qualitative research. *PloS one*, 15(5), p.e0232076.

Handfield, R., Jeong, S. and Choi, T., (2019_). Emerging procurement technology: data analytics and cognitive analytics. *International Journal of Physical Distribution & Logistics Management*, 49(10), pp.972-1002.

Harris, F., McCaffer, R., Baldwin, A. and Edum-Fotwe, F., (2021). *Modern construction management*. John Wiley & Sons.

Hooper, A. and Holtbrügge, D., (2020). Blockchain technology in international business: changing the agenda for global governance. *Review of International Business and Strategy*, 30(2), pp.183-200.

Ingold, H., Mwerinde, O., Ross, A.L., Leach, R., Corbett, E.L., Hatzold, K., Johnson, C.C., Ncube, G., Nyirenda, R. and Baggaley, R.C., (2019). The Self-Testing Africa (StAR)

initiative: accelerating global access and scale-up of HIV self-testing. *Journal of the International AIDS Society*, 22, p.e25249.

Ivanov, D., Dolgui, A. and Sokolov, B., (2019). The impact of digital technology and Industry 4.0 on the ripple effect and supply chain risk analytics. *International Journal of Production Research*, 57(3), pp.829-846.

Jiang, Z., Henneberg, S.C. and Naudé, P., (2011). Supplier relationship management in the construction industry: the effects of trust and dependence. *Journal of Business & Industrial Marketing*, 27(1), pp.3-15.

Kamotho, D.K., (2014). E-Procurement and procurement performance among state corporations in Kenya (Doctoral dissertation, University of Nairobi).

Khan, S.A.R., Razzaq, A., Yu, Z. and Miller, S., (2021). Industry 4.0 and circular economy practices: A new era business strategies for environmental sustainability. *Business Strategy and the Environment*, 30(8), pp.4001-4014.

Kiage, J.O., (2013). Factors affecting procurement performance: A case of ministry of energy. *International journal of business and commerce*, 3(1), pp.54-70.

Kiragu, R.W., (2012). Information Technology and procurement process in Kenya (Doctoral dissertation).

Kiragu, R.W., (2012). Information Technology and procurement process in Kenya (Doctoral dissertation).

Kiragu, R.W., (2012). Information Technology and procurement process in Kenya (Doctoral dissertation).

Klenke, K., (2016). Grounded Theory and Ethnography. In *Qualitative Research in the Study of Leadership* (pp. 179-206). Emerald Group Publishing Limited.

- Knofczynski, T.G., (2017). Sample sizes for predictive regression models and their relationship to correlation coefficients. *Journal of Mathematical Sciences & Mathematics Education*, 12(2), p.12.
- Komakech, R.A., (2016). Public procurement in developing countries: Objectives, principles and required professional skills. *Public Policy and Administration Research*, 6(8), pp.20-29.
- Kumar, N. and Ganguly, K.K., (2021). External diffusion of B2B e-procurement and firm financial performance: Role of information transparency and supply chain coordination. *Journal of Enterprise Information Management*, 34(4), pp.1037-1060.
- Leu, J.D. and Lee, L.J.H., (2017). Enterprise resource planning (ERP) implementation using the value engineering methodology and Six Sigma tools. *Enterprise Information Systems*, 11(8), pp.1243-1261.
- Leuschner, R., Rogers, D.S. and Charvet, F.F., (2013). A meta-analysis of supply chain integration and firm performance. *Journal of Supply Chain Management*, 49(2), pp.34-57.
- Levers, M.J.D., (2013). Philosophical paradigms, grounded theory, and perspectives on emergence. *Sage Open*, 3(4), p.2158244013517243.
- Li, Y., Krefeld-Schwalb, A., Wall, D.G., Johnson, E.J., Toubia, O. and Bartels, D.M., (2022). The more you ask, the less you get: When additional questions hurt external validity. *Journal of Marketing Research*, 59(5), pp.963-982.
- Liu, H., Ke, W., Wei, K.K. and Hua, Z., (2013). The impact of IT capabilities on firm performance: The mediating roles of absorptive capacity and supply chain agility. *Decision support systems*, 54(3), pp.1452-1462.
- Marshall, D., McCarthy, L., Claudy, M. and McGrath, P., (2019). Piggy in the middle: How direct customer power affects first-tier suppliers' adoption of socially responsible procurement practices and performance. *Journal of business ethics*, 154, pp.1081-1102.

Marshall, D., McCarthy, L., Claudy, M. and McGrath, P., (2019). Piggy in the middle: How direct customer power affects first-tier suppliers' adoption of socially responsible procurement practices and performance. *Journal of business ethics*, 154, pp.1081-1102.

Mbaka, N. and ISIRAMEN, O.M., (2021). The Changing Role Of An Exploratory Research In Modern Organisation. *GPH-International Journal of Business Management*, 4(12), pp.27-36.

McDermott, R., (2011). Internal and external validity. *Cambridge handbook of experimental political science*, 27.

Mose, J.M., Njihia, J.M. and Magutu, P.O., (2013). The critical success factors and challenges in e-procurement adoption among large scale manufacturing firms in Nairobi, Kenya.

Muriuki, J.I., (2021). Effect of Information and Communication Technology on Procurement Performance in Energy Sector State Corporations in Kenya (Doctoral dissertation, JKUAT-COHRED).

Musanzikwa, M., (2013). Public procurement system challenges in developing countries: The case of Zimbabwe. *International Journal of Economics, Finance and Management Sciences*, 1(2), pp.119-127.

Muturo, W.J., Makokha, E.N. and Namisonge, G., (2018). Factors affecting procurement planning in Bungoma County Government in Kenya. *European Journal of Business*, 5(34), pp.74-82.

Mwangi, E.W. and Kagiri, A., (2016). Effects of e-procurement on procurement performance in hospitality industry in Kenya: Case of Sarova chain of hotels. *International Academic Journal of Procurement and Supply Chain Management*, 2(2), pp.1-19.

Nani, D.A. and Ali, S., (2020). Determinants of Effective E-Procurement System: Empirical Evidence from Indonesian Local Governments. *Jurnal Dinamika Akuntansi Dan Bisnis*, 7(1), pp.33-50.

Nani, D.A. and Ali, S., (2020). Determinants of Effective E-Procurement System: Empirical Evidence from Indonesian Local Governments. *Jurnal Dinamika Akuntansi Dan Bisnis*, 7(1), pp.33-50.

Nyakundi, M.G., (2018). Procurement best practices and procurement performance of SMEs in Nairobi county (Doctoral dissertation, university of nairobi).

Nyangaresi, E.N., (2016). *Stakeholder perception on implementation of public E-procurement in Kenya* (Doctoral dissertation, Strathmore University).

Oh, S., Yang, H. and Kim, S.W., (2014). Managerial capabilities of information technology and firm performance: role of e-procurement system type. *International Journal of Production Research*, 52(15), pp.4488-4506.

Okinyi, T.O. and Muturi, W., (2016). Factors affecting efficiency of procurement in public institutions: a case of public entities in Homabay County. *International Journal of Social Sciences and Information Technology*, 2(2), pp.1-14.

Omar, I.A., Jayaraman, R., Debe, M.S., Salah, K., Yaqoob, I. and Omar, M., (2021). Automating procurement contracts in the healthcare supply chain using blockchain smart contracts. *IEEE Access*, 9, pp.37397-37409.

Onwuegbuzie, A.J. and Collins, K.M., (2007). A typology of mixed methods sampling designs in social science research. *Qualitative report*, 12(2), pp.281-316.

Oribhabor, C.B. and Anyanwu, C.A., (2019). Research sampling and sample size determination: a practical application. *Journal of Educational Research (Fudjer)*, 2(1), pp.47-57.

- Oyebanjo, O. and Tengeh, R.K., (2020). Public Procurement and Environmental Sustainability in Developing Countries: A South African Perspective.
- Patel, K.K., Patel, S.M. and Scholar, P., (2016). Internet of things-IOT: definition, characteristics, architecture, enabling technologies, application & future challenges. *International journal of engineering science and computing*, 6(5).
- Pavlou, P.A. and Fygenson, M., (2006). Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior. *MIS quarterly*, pp.115-143.
- Polit, D.F. and Beck, C.T., (2010). Generalization in quantitative and qualitative research: Myths and strategies. *International journal of nursing studies*, 47(11), pp.1451-1458.
- Polit, D.F. and Beck, C.T., (2010). Generalization in quantitative and qualitative research: Myths and strategies. *International journal of nursing studies*, 47(11), pp.1451-1458.
- Prahinski, C. and Benton, W.C., (2004). Supplier evaluations: communication strategies to improve supplier performance. *Journal of operations management*, 22(1), pp.39-62.
- Queirós, A., Faria, D. and Almeida, F., (2017). Strengths and limitations of qualitative and quantitative research methods. *European journal of education studies*.
- Radhakrishna, R.B., (2007). Tips for developing and testing questionnaires/instruments. *The Journal of Extension*, 45(1), p.25.
- Ramkumar, M., Schoenherr, T., Wagner, S.M. and Jenamani, M., (2019). Q-TAM: A quality technology acceptance model for predicting organizational buyers' continuance intentions for e-procurement services. *International Journal of Production Economics*, 216, pp.333-348.
- Rejeb, A., Süle, E. and G Keogh, J., (2018). Exploring new technologies in procurement.
- Robinson, O.C., (2014). Sampling in interview-based qualitative research: A theoretical and practical guide. *Qualitative research in psychology*, 11(1), pp.25-41.
- Rodríguez-Escobar, J.A. and González-Benito, J., (2015). The role of information technology in purchasing function. *Journal of Business & Industrial Marketing*, 30(5), pp.498-510.

Rodríguez-Escobar, J.A. and González-Benito, J., (2015). The role of information technology in purchasing function. *Journal of Business & Industrial Marketing*.

Rotich, G.K. and Okello, B., (2015). Analysis of use of e-procurement on performance of the procurement functions of county governments in Kenya. *International Journal of Economics, Commerce and Management*, 3(6), pp.1381-1398.

Rotich, G.K. and Okello, B., (2015). Analysis of use of e-procurement on performance of the procurement functions of county governments in Kenya. *International Journal of Economics, Commerce and Management*, 3(6), pp.1381-1398.

Rudko, I., Bashirpour Bonab, A. and Bellini, F., (2021). Organizational structure and artificial intelligence. Modeling the intraorganizational response to the ai contingency. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(6), pp.2341-2364.

Salim, A.S. and Kitheka, S., (2019). Effect of procurement planning on procurement performance of state corporations in Mombasa County, Kenya.

Saunders, B., Sim, J., Kingstone, T., Baker, S., Waterfield, J., Bartlam, B., Burroughs, H. and Jinks, C., (2018). Saturation in qualitative research: exploring its conceptualization and operationalization. *Quality & quantity*, 52, pp.1893-1907.

Schell, C., (1992). The value of the case study as a research strategy. *Manchester Business School*, 2(1), pp.1-15.

Schmidt, C.G. and Wagner, S.M., (2019). Blockchain and supply chain relations: A transaction cost theory perspective. *Journal of Purchasing and Supply Management*, 25(4), p.100552.

Schmidt, J. and Keil, T., (2013). What makes a resource valuable? Identifying the drivers of firm-idiosyncratic resource value. *Academy of Management Review*, 38(2), pp.206-228.

Schoenherr, T. and Speier-Pero, C., (2015). Data science, predictive analytics, and big data in supply chain management: Current state and future potential. *Journal of Business Logistics*, 36(1), pp.120-132.

Schwalbe, K., (2015). *Information technology project management*. Cengage Learning.

Shahzad, F., Xiu, G. and Shahbaz, M., 2017. Organizational culture and innovation performance in Pakistan's software industry. *Technology in society*, 51, pp.66-73.

Sharma, G., (2017). Pros and cons of different sampling techniques. *International journal of applied research*, 3(7), pp.749-752.

Shen, Y.C., Chen, P.S. and Wang, C.H., (2016). A study of enterprise resource planning (ERP) system performance measurement using the quantitative balanced scorecard approach. *Computers in Industry*, 75, pp.127-139.

Simon, J., Porterfield, P., Bouchal, S.R. and Heyland, D., (2015). 'Not yet' and 'Just ask': barriers and facilitators to advance care planning—a qualitative descriptive study of the perspectives of seriously ill, older patients and their families. *BMJ supportive & palliative care*, 5(1), pp.54-62.

Skulmoski, G.J., Hartman, F.T. and Krahn, J., (2007). The Delphi method for graduate research. *Journal of Information Technology Education: Research*, 6(1), pp.1-21.

Sreedevi, R. and Saranga, H., (2017). Uncertainty and supply chain risk: The moderating role of supply chain flexibility in risk mitigation. *International Journal of Production Economics*, 193, pp.332-342.

Stek, K. and Schiele, H., (2021). How to train supply managers—necessary and sufficient purchasing skills leading to success. *Journal of purchasing and supply management*, 27(4), p.100700.

Suresh, K.P. and Chandrashekhara, S., (2012). Sample size estimation and power analysis for clinical research studies. *Journal of human reproductive sciences*, 5(1), p.7.

- Susarla, A. and Mukhopadhyay, T., (2018). Can outsourcing of information technology foster innovations in client organizations? An empirical analysis. *Forthcoming, MIS Quarterly*.
- Suzuki, O., (2011). A Contingency Perspective on Organizational Ambidexterity. *Social Sciences Review, 16*.
- Tai, Y.M., Ho, C.F. and Wu, W.H., (2010). The performance impact of implementing web-based e-procurement systems. *International Journal of Production Research, 48(18)*, pp.5397-5414.
- Taouab, O. and Issor, Z., (2019). Firm performance: Definition and measurement models. *European Scientific Journal, 15(1)*, pp.93-106.
- Terpend, R. and Ashenbaum, B., (2012). The intersection of power, trust and supplier network size: Implications for supplier performance. *Journal of Supply Chain Management, 48(3)*, pp.52-77.
- Thai, K.V., (2001). Public procurement re-examined. *Journal of public procurement*.
- Thai, K.V., (2017). International public procurement: Concepts and practices. In *International handbook of public procurement* (pp. 1-24). Routledge.
- Topi, H., Kaiser, K.M., Sipior, J.C., Valacich, J.S., Nunamaker Jr, J.F., de Vreede, G.J. and Wright, R., (2010). *Curriculum guidelines for undergraduate degree programs in information systems*. ACM.
- Treiblmaier, H. and Filzmoser, P., (2010). Exploratory factor analysis revisited: How robust methods support the detection of hidden multivariate data structures in IS research. *Information & management, 47(4)*, pp.197-207.
- Tutu, S.O., Kissi, E., Osei-Tutu, E. and Desmond, A., (2019). Evaluating critical factors for the implementation of e-procurement in Ghana. *International Journal of Procurement Management, 12(1)*, pp.1-14.

- Tutu, S.O., Kissi, E., Osei-Tutu, E. and Desmond, A., (2019). Evaluating critical factors for the implementation of e-procurement in Ghana. *International Journal of Procurement Management*, 12(1), pp.1-14.
- Vaidya, K. and Campbell, J., (2016). Multidisciplinary approach to defining public e-procurement and evaluating its impact on procurement efficiency. *Information Systems Frontiers*, 18, pp.333-348.
- Van Ham, M. and Feijten, P., (2008). Who wants to leave the neighbourhood? The effect of being different from the neighbourhood population on wishes to move. *Environment and Planning A*, 40(5), pp.1151-1170.
- Van Looy, A., (2021). A quantitative and qualitative study of the link between business process management and digital innovation. *Information & Management*, 58(2), p.103413.
- Wambui, E.N., (2013). Role of procurement on organization performance; a survey study of public secondary schools in Imenti North District, Kenya. *Int. J. Soc. Sci. Entrepreneurship*, 1(3), pp.289-302.
- Wang, E.T., Tai, J.C. and Grover, V., (2013). Examining the relational benefits of improved interfirm information processing capability in buyer-supplier dyads. *MIS quarterly*, pp.149-173.
- Wang, G., Gunasekaran, A., Ngai, E.W. and Papadopoulos, T., (2016). Big data analytics in logistics and supply chain management: Certain investigations for research and applications. *International journal of production economics*, 176, pp.98-110.
- Wu, F., Zsidisin, G. and Ross, A., (2007). Antecedents and outcomes of e-procurement adoption: an integrative model. *IEEE Transactions on Engineering Management*, 54(3), pp.576-587.

Zailani, S., Jeyaraman, K., Vengadasan, G. and Premkumar, R., (2012). Sustainable supply chain management (SSCM) in Malaysia: A survey. *International journal of production economics*, 140(1), pp.330-340.

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APPENDIX I
QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF BUSINESS

DEPT. OF SUPPLY CHAIN AND INFORMATION SYSTEMS [SCIS]

Target group: Manufacturing Firms

Dear respondent,

Thank you for your willingness to participate in this study. The study focuses on assessing
“Mediation effect of Planning and Control on the relationship between information technologies and procurement management in manufacturing firms: A Case Study of Manufacturing Firms in Ghana.”

The research is purely for academic purpose and as such privacy and confidentiality of all information shall be observed. To fairly report on the research work, you are implored to answer the questions with all honesty and sincerity.

I would therefore be grateful if you could kindly answer the following questions. Thank you.

SECTION A: DEMOGRAPHIC CHARACTERISTICS OF RESPONDENTS

For the following questions, kindly select by checking (✓) all that apply.

1. Gender?

- A. Male () B. Female ()

2. Age?

- A. 25 years or less () B. 26-35 years ()
 C. 36-45 years () D. 46-55 years () E. above 55 years ()

3. Education?

- A. SSSCE/WASSCE () B. Diploma (HND) () C. First Degree ()
 D. Masters () E. PhD () F. Professional Certificate ()

5. How long have you worked in this company?

- A. Less than 5 years () B. 6-10 years () C. 11-15 years () D. 16-20 years ()
 E. More than 20 years ()

6. Position?

- A. Operations Manager () B. Supply chain manager () C. Warehouse Manager ()
 D. Procurement Officer () E. Risk Manager ()

SECTION B- INFORMATION TECHNOLOGY

The following items relate to Information Technology. Please indicate the extent to which you agree with the following statement on a scale of 1-5.

1	2	3	4	5
Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
#	ITEMS			

		1	2	3	6	7
1	We have the necessary software to make money transfers and payments to suppliers					
2	Our purchasing personnel has advice and support for the use of it at their disposal					
3	The purchasing department has peripheral equipment for their exclusive use (printers, scanners, etc.)					
4	Our company runs an efficient system which helps in Order processing for Purchasing					
5	Our company uses automated invoice entry processing system.					
6	Our company uses electronic interchange of business documents (EDI) to aid processing document processing.					
7	Our company runs supplier portal which help to manage the companies supplies					
8	Our e-procurement initiatives help in cost reductions, closer relationships, improved information, increased efficiencies and the strategic use of purchasing staff.					

SECTION C – PROCUREMENT PLANNING

The following items relate to Procurement Planning of the firm. Kindly use the 5-point scale below to provide the appropriate responses.

1	2	3	4	5		
Strongly Disagree	Disagree	Nuetral	Agree	Strongly Agree		
#	ITEMS	1	2	3	4	5
1	Our company actively performed need identification and Prioritization.					
2	Our company planning is participatory (involving all relevant parties i.e. procurement department).					
3	Our company adhere to procurement plan set by management.					

4	Our company put system in place to ensure timely procurements					
5	Our organization through their procurement department have established better need evaluation methods that enhances efficiency and performance					
6	Our company have the best requirement realization in the procurement department when it comes to need identification					
7	We have established clear design quarterly budget system that enhances the organization to achieve value for money					
8	The organization has incorporated measures in place for procurement department on how it can procure items using supplementary budgets					

SECTION D – PROCUREMENT PERFORMANCE

The following items relate to procurement management of the company. Kindly use the 5-point scale below to provide the appropriate responses. Thank you.

1	2	3	4	5		
Strongly Disagree	Disagree	Nuetral	Agree	Strongly Agree		
#	ITEMS					
		1	2	3	4	5
1	Our company record high reliability of purchased products					
2	There is always Fulfillment of agreed delivery requirements by suppliers (quantity, quality, format, etc.)					
3	There is always fulfillment of agreed schedules by suppliers					
4	Our company record low cost of purchases					
5	We have reduce errors in order transmission					
6	We have significant reductions in the time taken to complete the procurement process					
7	Our company has exhibited stronger Vendor-Buyer Relationship					

8	We have reduced work content in the total „requisition to payment“ process					
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Thank you for participating!!!

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