

KWAME NKRUMAH UNIVERSITY FOR SCIENCE AND TECHNOLOGY

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**INFORMATION SHARING AND PROCUREMENT PERFORMANCE: THE
MODERATING ROLE OF INFORMATION TECHNOLOGY ADOPTION**

**A DISSERTATION PROPOSAL PRESENTED TO THE DEPARTMENT OF
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PROCUREMENT AND SUPPLY CHAIN MANAGEMENT**

BY

HILDA ABOYER

(BSc. Procurement and Supply Chain Management)

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KNUST



DECLARATION

‘I hereby declare that this submission is my own work towards the Master of Science in **Procurement and Supply Chain Management** degree and that, to the best of my knowledge, it contains no material previously published by another researcher which has been accepted for the award of any other degree of the University except where due acknowledgement has been made in the text’.

Hilda Aboyer

Signature:

Date: ____/____/____ (PG

9442129)

Dr. Emmanuel K. Anin

Signature:

Date: ____/____/____

(Supervisor)

PROF. David Asamoah

Signature:

Date: ____/____/____

(Head of Department)

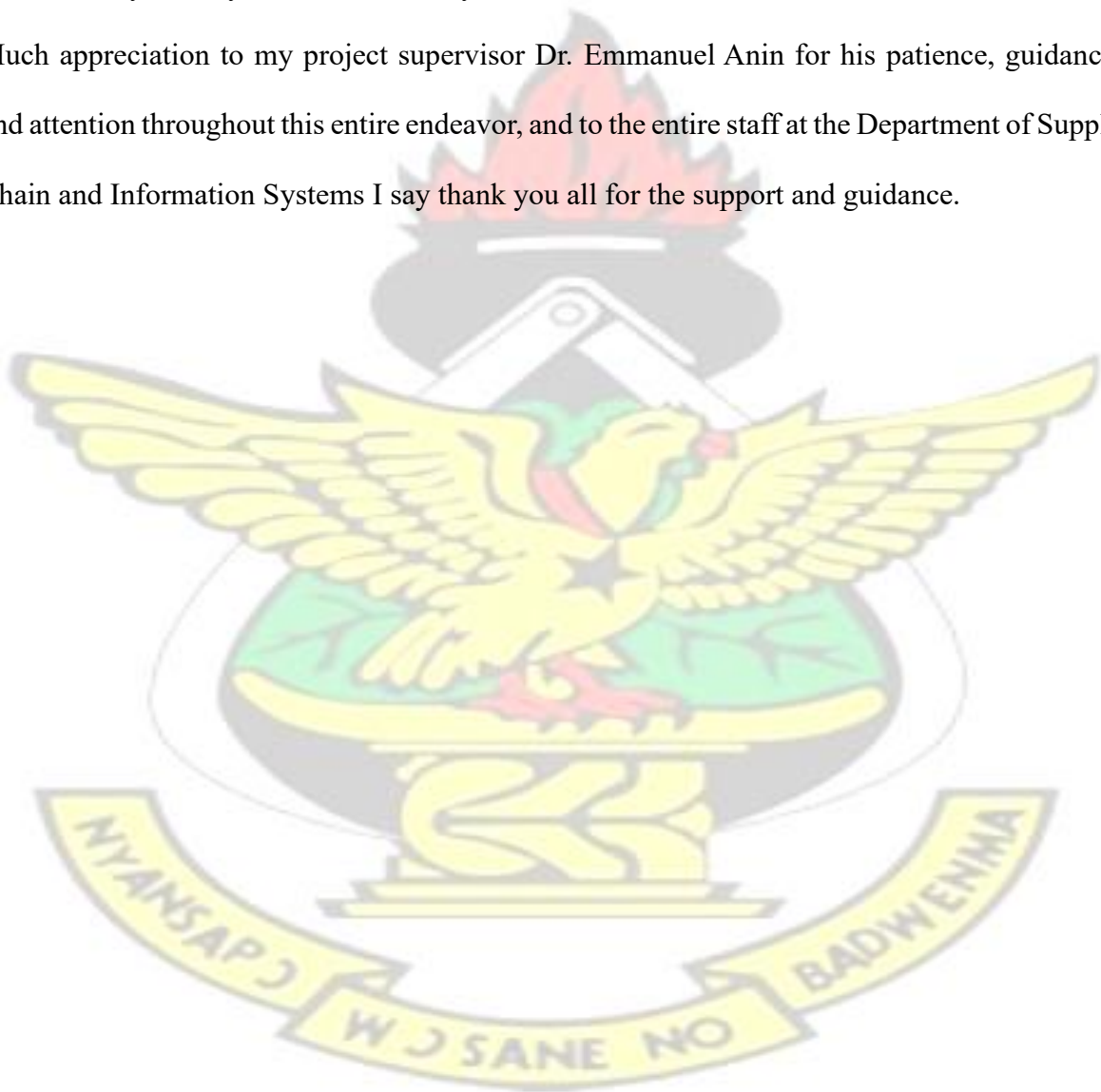
DEDICATION

This project is specially dedicated to my beloved parents

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My first gratitude goes to the Almighty God for His mercies and guidance throughout my one year of study. Then to my parents and guardians especially Mrs. Clothilda Aboyer, Mr. Franklin Sarfo, Mr. Joseph Ansona Koyaara and Miss Melda Aboyer who had been my bedrock and inspiration and supporters both in-kind, cash, and prayer, without them, this wouldn't be possible I say thank you and God bless you.

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ABSTRACT

Information Sharing is a vital component in enhancing supply chain management which promotes better coordination and integration between stakeholders in business networks.

Insufficient information sharing among stakeholders within organizations' networks can compromise relationships built and the quality of information shared to accomplish set goals. The study sought to examine the moderating role of information technology adoption in the relationship between information sharing and procurement performance. study adopts a survey design to examine the extent to which information sharing in organizations drives procurement performance under the influence of information technology. The population of the study comprise of public agencies operating under the governance of Ghana with the Northern Regions. A total of 87 respondents were selected using the purposive sampling technique. A structured questionnaire was used as an instrument to collect data from the firms. To ensure that there was validity and reliability of findings, existing measures were adapted to tap into the study's constructs. The study employed the descriptive and inferential statistics to analyse the quantitative data with the aid of the SPSS. The result presented showed that information sharing positively and significantly affects procurement performance. Additional results show that information technology adoption positively moderate the relationship between information sharing procurement performance. It is recommended that practitioners invest in the adoption of such technology to facilitates the efficient exchange of information and improve procurement performance.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Information Sharing is a vital component in enhancing supply chain management which promotes better coordination and integration between stakeholders in business networks (Baihaq and Sohal, 2013). Previous literature argues that information sharing is a prerequisite for knowledge sharing and collaborations within supply chain networks that accelerate operational performance (Rashed, Azeem and Halim, 2010). According to Pandey, Garg and Shankar (2010), insufficient information sharing among stakeholders within organizations' networks can compromise relationships built and the quality of information shared to accomplish set goals. Al-Ali (2021) posits that information sharing is the exchange of data and strategies between individuals and technologies within and outside of an organization. These data may be proprietary information that includes logistics, purchasing, cultural, operational, technical, managerial, strategic and financial details of systems and organizational activities (Pandey, Garg and Shankar, 2010; Deghedi, 2014). Information sharing when done properly improves collaborations for better decision-making for strategic actions; increases productivity and efficiency; and reduces cost and the bullwhip effect in organizations (Tai and Ho, 2010; Baihaqi and Sohal; 2013; Lee, Padmanabhan and Whang, 1997). Hence, the quality and intensity of information shared are critical in achieving a competitive advantage over other competitors in dynamic business environments. However, for organizations to thrive in this globalized economy, they need to invest heavily in digital technologies and information infrastructure to equip their supply chain partners with appropriate information systems to satisfy customers' needs efficiently and effectively (Lewis and Talalayevsky, 2000).

Digitalization is notably a critical phenomenon in procurement management and the effective collaboration among supply chain networks for organizational performance (Rai et al., 2006).

Recent studies argue that information technology adoption has contributed immensely to the transformation of business processes, strategies and operations in supply chain management in general (Handfield, Joeng and Chi, 2019; Toorajipour et al, 2021). Information technology describes the hardware and software elements of computer systems that support and sustain organizational operations, management and strategic planning (Sundram, Chhetri and Bahrim (2020). As organizations depend on analytically derived business decisions to provide solutions related to purchasing and supply management issues, the deployment of a set of procurement technology is a necessity (McAfee and Brynjolfsson, 2012; Monczka et al., 2016). For example, systems like procure-to-pay, electronic resource planning, contract management, cloud computing, artificial intelligence, internet of things, robotics and big data analytics are considered vital in solving problems with purchasing functions (Handfield, Joeng and Chi, 2019; Rejeb, Sule and Keogh, 2018). Thus, information technology influences the decisionmaking process in procurement management (Chen, Preston and Swink, 2015). According to Toka et al. (2013), these emerging technologies improve efficiency, visibility and flexibility, sustainability as well as generate profits and simplify the operations of organizations for overall firm performance. Day (2002) stated that internal procurement accounts for around 80% of cost-related issues in organizations demonstrating the need for firms to engage in information technologies to spur innovation and partnerships toward a value chain. Undoubtedly, information technologies strengthen internal processes which significantly enhance overall firm performance in the long term (Han and Nielsen, 2018).

According to Kakwezi and Nyeko (2019), performance is a measurement index for organizations to identify their strengths and weaknesses in achieving set objectives. In recent years, procurement performance has been regarded as one of the most important organizational performance measurement indicators that forecast performance in manufacturing organizations (Laosirihongthong, Samaranayake and Nagalingam 2019; Malyvia and Kant 2019). Kamble et

al. (2019) described procurement performance as when predetermined goals and objectives are fulfilled by the procurement function at the least expensive cost level. Here, the effectiveness and efficiency of organizational actions must be evident in the balance between financial and non-financial measures in decision-making processes (Mukopi and Iravo, 2015). This plays a key role in improving the quality of services and products in organizations (Amaratunga and Baldry, 2002).

In this globalized and ever-changing environment, organizations need to employ information technologies and information-sharing resources transactional and information-shared processes to optimize performance in organizations (Rejeb, Sule and Keogh, 2018; Lei et al, 2019). Accordingly, this study is set to examine the extent to which information sharing drives procurement performance and how this relationship is affected by information technology.

1.2 Problem Statement

According to Nazifa and Ramachrandram (2018), the act of sharing information across partners within a supply chain has been observed to have beneficial outcomes in terms of product quality, business operations, and the overall success of the firm. The significance of information sharing in supply chain networks for achieving performance has been acknowledged in previous literature (Baihaqi and Sohal, 2013). However, there is a scarcity of empirical research that specifically examines the association between information sharing and procurement performance, particularly in the context of developing economies. According to Baihaqi and Sohal (2013), research on how the intensity and quality of information sharing affect performance in organizational networks remains limited.

In addition, information technology adoption plays a key role in how information sharing affects procurement performance (Rejeb, Sule and Keogh, 2018). Prior research indicates that effective information sharing depends on the extent to which a firm adopts information

technology (Parvianien et al., 2017; Sailer et al., 2019), suggesting that the information sharing performance outcome may be contingent on the degree of IT adoption. Despite this recognition,

In an attempt to address these gaps, the study develops a model that uses the resource-based view theory to examine how information sharing drives procurement performance and whether a firm's information technology adoption limits or enhances this relationship.

1.3 Objectives of the Study

The study is guided by the following objectives:

1. To examine the extent to which information sharing drives procurement performance.
2. To assess the effect of information technology on procurement performance.
3. To examine the moderating effect of information technology in the relationship between information sharing and procurement performance.

1.4 Research Questions.

1. To what extent does information sharing drive procurement performance?
2. Does information technology drive procurement performance?
3. Does information technology moderate the relationship between information sharing and procurement performance?

1.5 Significance of Study

This research contributes to information sharing literature in so many ways. First, the research extends the logic of the resource-based view theory to the information-sharing concept by examining its association with procurement performance. Secondly, this study extends the boundary of the information sharing literature by accounting for the contingency role of

information technology in the effect of the information sharing and procurement performance relationship. Moreover, in the context of the developing economy perspective to the study of information sharing, this research helps expand the empirical scope of the information sharing concept and its consequence on procurement performance. Lastly, the study provides practitioners with the importance of information technology in implementing informationsharing resources and initiatives and the need to make efforts to deploy digital technologies to enhance procurement performance in organizations.

1.6 Overview of Research Methodology

The study adopts a survey design to examine the extent to which information sharing in organizations drives procurement performance under the influence of information technology. The population of the study comprise of public agencies operating under the governance of Ghana with the Tamale Metropolis in the Savannah Region. Respondents were selected using the purposive sampling technique. A total of 100 organisations in the Northern Regions were involved. A structured questionnaire was used as an instrument to collect both qualitative and quantitative data from the firms. To ensure that there was validity and reliability of findings, existing measures were adapted to tap into the study's constructs. The study employed the descriptive and inferential statistics to analyse the quantitative data with the aid of the SPSS.

1.7 Scope of the Study

The study's primary focus is to examine how information sharing drives procurement performance under the influence of information technology. It emphasized the moderating role of information technology in ensuring overall procurement performance. Empirically, the study was carried out within Tamale, the Savannah Region of Ghana.

1.8 Limitation of Study

This study was limited to 100 public agencies hence, such a limited sample size and scope may limit the generalization of the study. Future studies may therefore extend the scope to cover more public firms across different geographical locations to improve the generalizability of the findings. Though the study focused on three key variables; information sharing, information technology and procurement performance, future studies extend this literature by including and exploring additional constructs/variables to extend the literature on information sharing.

1.9 Organization of Study

The first chapter of this study presents the background of the study, problem statement, research objectives and questions, significance, methodology, scope, and limitations of the study respectively. Chapter two reviews the literature on information sharing (independent variable), procurement performance (dependent variable) and the extent to which information technology (moderating variable) affect the relationship between information sharing and procurement performance. Chapter three discusses the research's methodology which includes the research approach and design, sampling technique and size, data collection, population, data analysis, reliability and validity, and ethical consideration. Chapter four focuses on the results of the data analysis and discussions. Chapter five summarises key findings and presents conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focused on the discussion of relevant literature on the key variables of the study. Under this section, prior conceptual reviews, theoretical studies, and empirical reviews of the concepts of information sharing, procurement performance, information technology adoption and the relationship between the variables are reviewed.

2.2 Conceptual Review

2.2.1 Defining Information Sharing

Information is undoubtedly one of the crucial and fundamental areas in supply chain management (Shen, Choi and Minner, 2018). As supply chain partners interact and collaborate in the modern business environment, information sharing is key to smooth business operations. Information Sharing is vital in the attainment of organizational performance in supply chains (Baihaqi and Sohal, 2013). Previous studies posit that performance in organizations varies and is dependent on how information is shared (Flynn, 2002). In high-performance organizations, technological tools and initiatives are utilized in sharing quality data to supply chain partners for effective decision-making and operational efficiency (Ben-Daya, Hassini and Bahroun, 2017). Information sharing is classified based on its intensity and quality (Baihaqi and Sohal, 2013; Baba et al., 2021). Hence, the intensity and quality of information shared are the foundation for growth in organizations.

While the intensity of information reflects the extent to which several distinct types of information are shared in organizations (Cai, Jun and Yang, 2006), the quality of information shared is the degree to which the information shared satisfies the objectives of the organization (Petersen 1999). With this, the information shared becomes accurate, reliable and flexible to

be used throughout the supply chain. Information sharing is a key capability of exploiting, exchanging and sharing essential, accurate and quality data willingly by supply chain members to promote organizational performance (Baba et al., 2021; Ramantoko and Irawan, 2017; Deghedi, 2014). This is critical in the exploitation of knowledge across supply chain partners. Several definitions of information sharing have been presented in extant literature. For example, Ramantoko and Irawan (2017) define the concept of information sharing as the ability to share or exchange information to address a range of requirements, including the exchange of service-related information among entities involved in the provision of seamless services to facilitate business transaction. Ukangwa and Otuza and Ehioghae (2020) also define information sharing as a concept that encompasses the act of revealing, exchanging, or receiving personal information by various means, such as transmission, distribution of a copy, or review of a record, between individuals or entities. Relatedly, Deghedi (2014) conceives information Sharing as the willingness to exchange data (financial, managerial, technical, cultural, operational, etc.) and make it available to participants (systems, people, and processes) in the supply chain. Drawing from the foregoing, this study conceptualises information sharing as the extent to which firms exchange relevant business information with their business partners across their supply chain. Table 2.1 presents varied definitions of information sharing.

Table 2.1: Definitions of Information Sharing

Author	Definitions
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Ramantoko and Irawan (2017)	The ability to share information (IS) is a crucial skill necessary for the establishment of integrated and interconnected government systems. This capability addresses a range of requirements, including the exchange of service-related information among entities involved in the provision of seamless services, the sharing of information on accessible resources to facilitate a
	comprehensive government response to emergencies, and other similar intraorganizational, inter-organizational, or cross-national needs.
Ukangwa and Otuza and Ehioghae (2020)	The concept of information sharing encompasses the act of revealing, exchanging, or receiving personal information by various means, such as transmission, distribution of a copy, or review of a record, between individuals or entities.
Deghedri (2014)	Information Sharing is the willingness to exchange data (financial, managerial, technical, cultural, operational, etc.) and make it available to participants (systems, people and processes) in the supply chain
Baba et al., (2021)	Information Sharing is defined as essential in supply chains where accurate and quality data or information is made available to and shared amongst members to improve performance.

Baihaqi and Sohal (2013)	Information Sharing is a prerequisite for knowledge where information is shared and exploited through the collaboration and coordination of supply chain members to achieve superior performance.
Pandey, Garg and Shankar (2010)	Information sharing in the supply chain context refers to the extent to which crucial and/or proprietary information (eg. operations, strategies, purchasing, logistics) is available to members of the supply chain

Source: Researcher's Own Construction (2023) From the definitions presented, it is only in conjunction with other supply chain stakeholders can the merits of information sharing be discovered (Baba et al., 2021). Thus, companies cannot successfully compete on their own without the collaboration of other participants in the market (Min et al., 2016). According to Lee, Padmanabhan and Whang (1997), the efficient use of information and strategies in the manufacturing sector allows manufacturers and retailers to share essential information about inventory levels which in effect reduces the bullwhip effect in the distribution channels. However, the credibility of the information shared is a major factor in reducing the distortion of information received within the supply chain (Deghedi, 2014).

Previous studies have classified information sharing into several constructs. Deghedi (2014) categorizes information shared in organizations into available resources (inventory funds, capacity, capability), processes status (delivering, servicing, ordering, forecasting, etc.) performance status (quality, costs, time, etc.) and status of contracts. On the other hand, Li et al. (2001) argue that information shared in businesses is structured into (1) order information sharing - detailed information of the ordering process, (2) demand information sharing where every stage has a record of customers order, (3) inventory information sharing (bears detailed information on inventory levels and demand orders) and (4) shipment information which bears

the shipment data. Chopra and Meindl (2004) also argue that the flow of information shared across business environments and supply chains is filed into the supplier, manufacturer, distributor, retailer and customer information. Thus, information shared flows in a systematic way from the supplier to satisfy customers' demand and vice versa. Additionally, information sharing is sorted into data relating to resources, processes, inventory, products, demand and planning (Huang, Lau and Mak, 2003).

Evidently, information sharing is core to the tactical and strategic operations in the supply chain (Deghedi, 2014). Information sharing poses a lot of benefits for organizations in competitive business environments. Baihaqi and Sohal (2013) posit that organizations can increase their efficiency and productivity while reducing inventories through effective information sharing. Enabling information sharing across supply chain participants improves collaboration between participants and facilitates better decision-making and formulation of strategies that affect flexibility within supply chains (Kong et al., 2004). Organizations today, are investing and deploying more tangible and intangible resources in information sharing to manage their learning processes to improve productivity and other laid-out operational systems (Shen, Choi and Minner, 2018).

Similarly, information-sharing permits organizations' internal and external intangible resources (knowledge) to efficiently integrate for the effective retrieval of data stored and for smooth information flow among the organizations' stakeholders (Liu et al, 2013). This promotes the organization's competitiveness. Setia and Patel (2013) express that the integrated database and greater coordination derived from information sharing within supply chains strengthen the capabilities and utilization of intangible resources for new product development. When information sharing is done properly, it promotes businesses' agility and flexibility, giving them a competitive edge over other businesses.

2.2.2 Procurement Performance

Procurement performance has received a lot of attention from scholars and practitioners since the 1930s (Kakwezi and Nyeko, 2019). According to Callender and Mathews (2000), the estimated financial activities of procurement managers in public sectors are 10% - 30% of the gross national product. Procurement encompasses the process of identifying a need through evaluating contingency solutions, risks and supplier assessment, contract award and payment details for projects and services (Amemba et al., 2013). Hence, it is considered an important asset in today's modern industries and most especially represents a bigger portion of manufacturing firms' success rate (Lysons, 2020; Ambekar, Deshmukh and Hudnurkar, 2020). The public procurement process should bear accurate information for decision-making, be transparent and prevent malpractices and guarantee all requirements are met (Amemba et al., 2013). According to Thai (2001), good procurement principles should be consistent, transparent, accountable and efficient to meet the stipulated objectives and enhance the performance of an organization.

Procurement performance is the act of assessing the efficacy and efficiency of an organization's productivity which provides the basis for attaining objectives and set goals (Anane and Kwarteng, 2019). Malviya and Kant (2019) also express that procurement performance measures the degree to which a purchasing function and process satisfy set objectives at the most affordable and competitive price. The evaluation of productivity and efficiency of procurement functions aids organizations to gain a competitive edge, enhance productivity and quality and reduce production costs (Basheka, 2009). Alabdullah (2021) asserts that the performance of an organization represents its capacity to achieve set goals through the utilization and exploitation of its external and internal resources. It shows the results and relationships between input and output results that lead to efficiency in the manufacturing and final consumption processes (Nyamah et al., 2022).

According to recent literature, an organization which is able to maximize resources to achieve high-quality end products to satisfy consumers while eliminating waste and minimising procurement costs involved of about 60% is considered highly productive (Bag et al, 2020; Malesios, Dey and Abdelaziz, 2020). To achieve this, procuring and purchasing resources go through a defined process. The procurement process as revealed by recent studies involves the meticulous planning and identification of a need, requisition review, supplier selections, contract management and safe disposal of goods and services (Ambekar, Deshmukh and Hudnurkar, 2020; Bag et al., 2020; Raj, Agrahari and Srivastava., 2020). Here, the success or failure rates of organizations highly depend on their procurement process (Raj, Agrahari and Srivastava., 2020). While various scholars have provided numerous definitions, the fundamental notion of procurement performance bears some similarities. Table 2.2 presents the varied definitions of procurement performance.

Table 2.2: Definitions of Procurement Performance

Authors	Definitions
Anane and Kwarteng (2019)	Procurement performance is the result of purchasing effectiveness and efficiency where set goals and objectives are successfully attained using the required resources.
Kamble et al., (2020)	Procurement performance is described as when anticipated goals and objectives are accomplished by the procurement function at the least expensive cost level.
Knudsen (1999)	Procurement performance describes how purchasing efficiency and effectiveness shift from reactive to proactive to achieve predetermined performance standards in an organization.

Van Weele (2002).	Procurement performance is a measure of all the goals and objectives attained with the least amount of cost by the procurement function.
Malviya and Kant (2019)	Procurement performance measures the degree to which a purchasing function and process meet set objectives at the most competitive and least cost.

Source: Researcher's Own Construction (2023).

From the above definitions, measuring the performance of procurement functions is very necessary to organizations as it enhances profitability, quality of services and products, secures qualified suppliers and promotes cost reduction schemes and competitive advantage (Batenburg and Versendaal (2006). Versendaal and Brinkkemper (2003) categorise procurement performance into product-quality-related (better product quality), cost-related (minimized expenditure), organization-related (credibility and accountability) and processrelated (decision-making and sourcing). Similarly, procurement performance indicators are classified into purchase price index, raw material inventory turnover, quality conformance and supplier delivery accuracy (Accenture, 2002). In sum, the procurement process embraces efficiency and effectiveness to achieve competitive advantage for organizations who carefully acknowledge it.

2.2.3 Information Technology Adoption

Over the years, the world has shifted towards a digital phase and digitalization has contributed a lot to this change (Toorajipour et al., 2021). Digitalization has driven organizations to deploy digital technologies in their daily business operations. Technology has played a crucial role in transforming business processes and strategies in supply chain management (Handfield, Jeong and Choi, 2019). According to Narayanan, Maruchek and Handfield (2009), technology has

changed the traditional paper-based methods to electronic communications and the way information is exchanged in business environments. These technological novelties and resources (eg. Smart devices, and advanced managerial resources) have changed the way businesses assess and share information (Büyüközkan and Göçer, 2018). Evidently, technological revolution has affected every industry in the supply chain globally (Büyüközkan and Göçer, 2018).

According to Pentthin and Dillman (2015), about 76% of organizations globally actively utilize the internet with half of them incorporating social media platforms as a medium to reach target audiences. These internet-based platforms help organizations reach old and newer audiences, expanding their customer base in the long term. Appiahene, Ussiph and Missah (2018) assert that information technology is the appropriate deployment of technological tools to operate and share digital data or information (text, videos etc.). These technological advancements continuously provide opportunities to exploit data to establish newer, relevant business intelligence in the world of consumer-supplier relationships (Handfield, Jeong and Choi, 2019). For example, cloud computing, ERP systems, artificial intelligence, procure-to-pay systems, blockchain, IoT and big data analytics are some of the digital technologies that are critical for higher efficiency and productivity in procurement departments of organizations (Jahani et al., 2021). Thus, these technologies are utilized to support purchasing processes, business strategies and functions to handle electronic transactions and information flows (Rejeb, Sule and Keogh, 2018).

With the rising importance of information technology and the deployment of digital resources, organizations continue to track the overall productivity of the employees and the firm itself through implanted chips, global positioning systems and radio frequency identification devices (Wasik, 2015). For instance, Amazon, FedEx and similar organizations remotely track their services, goods and deliverables for real-time accounts and records to measure their

productivity levels. Additionally, the adoption of information technology may improve the efficiency and effectiveness of an organization's decision-making unit and the speed, flexibility, intelligence, transparency, innovation and agility of their operations and strategies (Osmonbekov and Johnston, 2018; Büyüközkan and Göçer, 2018). Ultimately, information technology has aided in the streamlining of communications between organizations and their stakeholders (Rejeb, Sule and Keogh, 2018).

Table 2.3: Definitions of Information Technology

Author	Definitions
Ülengin and Uray (2005)	Information Technology is defined as the hardware, software and other digital technologies that drive competitiveness in supply chains
Appiahene, Ussiph and Missah (2018)	Information Technology is the appropriate deployment of technological tools to operate and share digital data or information (text, videos etc.)
Rehouma and Hofmann (2018)	IT adoption refers to the degree of willingness to use the possibilities offered by information processing related to tasks at the workplace
Ratheeswari (2018)	Information Technology also known as information communication technology refers to technologies that provide access to information through telecommunication.
Sundram, Chhetri and Bahrin (2020)	Information Technology refers to the software and hardware components of computer systems which allow for support and sustainability in the operating, management and strategizing within organizations

Source: Researcher's Own Construction (2023)

2.3 Theoretical Review

2.3.1 Resource-Based View (RBV) Theory

Barney (1991) posits the resource-based view theory as a critical predictor of competitive advantages and performance in organizations. To create competitive advantages for organizations, the resource-based view emphasizes utilising internal resources to achieve this goal (Fawcett et al., 2007). Scholars have proposed an extended RBV that posits that organizations ought to evaluate how to utilize both external and internal (firm-controlled) resources to increase overall organizational performance (Lavie, 2006; Hernández-Espallardo et al., 2010). Similar to this, the resource-based view focuses on the effective implementation of valuable resources and capabilities to acquire a long-term competitive advantage and superior operational performance (Ray, Barney and Muhanna, 2004). Barney (1991) categorizes firm-controlled resources into specific dimensions (human, physical, capital, information, and knowledge). In addition to allocating internal strategic resources, organizations also need to think about how to employ them (Chen et al., (2019). Hence, the process of analyzing and evaluating the internal and external strategies and resources is achieved through effective information sharing with stakeholders.

According to Ramantoko and Irawan (2017), information sharing involves harnessing the resource and the capability to exchange quality data within supply chains to achieve set goals. Moreover, information sharing is expressed as a human resources management practice which enhances work-related learning and work performance (Battistelli et al., 2019). In this context, the ability of organizations to utilize digital technologies and share information effectively and efficiently among supply chain partners is a crucial resource to promote procurement performance and achieve a competitive edge over other competitors. Thus, this model supports how organizations utilize internal and external resources (information, capital, human and

technologies) to achieve procurement performance through information sharing and information technology.

2.4 Empirical Review

2.4.1 Information Sharing, Information Technology Adoption and Procurement Performance

The empirical review of the study is addressed based on the research objectives. It is very important to determine how the flow (share or transfer) of information is managed within supply chains to achieve competitive advantage and performance (Al Tun Türker, Tunacan and Torkul, 2021). Nazifa and Ramachrandram (2018) reported that information sharing among supply chain partners has a positive and direct effect on product quality which in effect affects the overall firm performance. They further emphasize the significantly positive and indirect effects of product quality performance as it mediates the relationship between information sharing and business performance. Baihaqi and Sohal (2013) conducted a study to examine the impact of information sharing on organisational performance. Their findings revealed a positive and statistically significant correlation between the quality of information and the level of information sharing. Furthermore, it has been disclosed that while there exists an indirect influence of information dissemination on the performance of businesses, it is important for organisations to possess commendable internal protocols and engage in collaborative efforts with their stakeholders along the supply chain in order to attain exceptional performance.

Recent studies suggest that supply chain integration and collaboration play a vital role in the relationship between information sharing and firm performance (Baba et al., 2021; Chen et al., 2019; Sundram et al., 2018). Chen et al. (2019) assert that the link between supply chain information sharing and business performance is dependent on the full mediation of supply chain integration and operational performance. Moreover, the establishment of strong partnerships within supply chain networks requires a heightened degree of information

exchange. Consequently, cooperation serves as a direct mediator in the association between information sharing and performance (Baba et al., 2021). Organisations experience an enhancement in performance with this phenomenon. Sundram et al. (2018) posit that the mediating role of supply chain integration is crucial in the association between supply chain information management and supply chain information system infrastructure. These two elements are recognised as significant strategic resources that contribute to the enhancement of manufacturing performance.

Furthermore, it has been observed through empirical research that the act of sharing information has a good impact on the enhancement of all three aspects (internal, supplier, and customer) of supply chain learning, hence facilitating the improvement of organisational flexibility performance (Huo, Haq, & Gu, 2020). According to Gebisa and Ram (2020), there exists a positive and indirect relationship between an organization's performance and the sharing of information. This relationship is mediated by inventory management practises, which serve as an intermediary variable in the context of supply chain activities.

Owing to the synthesis of the literature above, it is observed that most moderators and mediators employed in the baseline relationships capitalize on integrations and collaborations which are internal within the supply chain. However, the moderating variable used for this current study is information technology adoption (an external resource presented by digitalization and globalization) which determines the intensity and extent to which quality information sharing affects procurement performance. Moreover, most of the literature focused on other types of performance other than procurement performance. This leads to the conclusion that information technology adoption and procurement performance have not received enough attention, emphasizing the need for additional empirical research on information sharing, information technology adoption, and procurement performance.


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Table 2.4: Empirical Review Table

Author(s)	Constructs/Concepts Used	Findings	Definitions
<p>Nazifa and Ramachandran (2018)</p> <p>Context: Malaysian Manufacturing Industry</p> <p>Theory Used: Not stated</p>	<p>Independent Variable: Information Sharing</p> <p>Mediator: Product Quality Performance</p> <p>Dependent Variables: Business Performance Product Quality Performance</p>	<p>Information Sharing between supply chain partners' determinants (demand forecast, inventory information and production information) have positive and direct effects on product quality performance.</p> <p>Information Sharing between supply chain partners has a positive and indirect effect on business performance through product quality performance.</p> <p>Product quality performance (especially product conformance, product performance, product</p>	<p>Supply chain management (SCM) is a network consisting of all parties involved (e.g., manufacturer, supplier, retailer, customer, etc), both downstream and upstream, directly or indirectly, for manufacturing and delivering a product or service to the end customers (Mentzer et al., 2001; Edwards, Nimako, Owusu Manu, & Conway, 2016)</p>

		reliability and product durability) has positive and direct effects on business performance (namely profitability, market share return on sales and return on assets)	
<p>Gebisa and Ram (2020)</p> <p>Context: Ethiopia</p> <p>Theories Used: Resource-based View Theory of Resource Constraint</p>	<p>Independent Variable: Information Sharing practice.</p> <p>Inventory Management Practice.</p> <p>Mediator: Inventory Management Practice</p> <p>Dependent Variables:</p>	<p>The study shows that there is a direct and positive relationship between inventory management and information sharing practices with firms' performance.</p> <p>There is an indirect and positive association between an organization's performance and information sharing, where inventory management practices act as an intermediary variable between a firm's performance and information sharing in the supply chain activities.</p>	<p>Information sharing is a systematic and deliberate way of sharing critical and proprietary information to supply chain partners (Li et al., 2005)</p> <p>Inventories are stocks of different items at various stages of the production system and logistics channels (Ballon, 2004).</p> <p>Performance measurement is the systematic way of measuring the productivity of resources, and every organization can measure its performance from different perspectives for multiple motives</p>

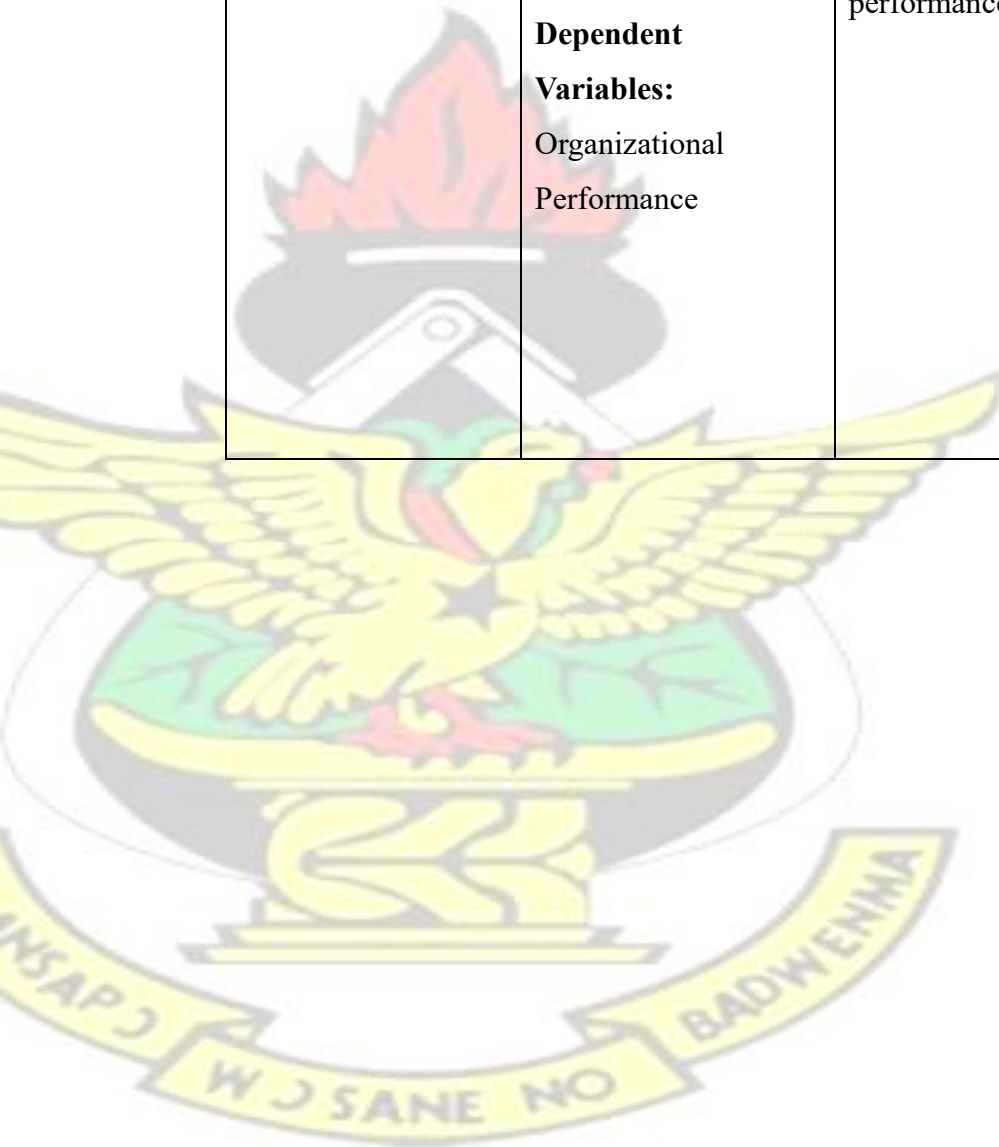
	<p>Supply Chain Performance</p>	<p>The results also show that enhanced information sharing and inventory management practice increase firms' performance; and increased information sharing practice improve inventory management practices that in turn positively contribute to the firm's performance.</p>	
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<p>Huo, Haq and Gu (2020)</p> <p>Context: China</p> <p>Theory Used: Absorptive Capacity Theory</p>	<p>Independent Variable: Information Sharing.</p> <p>Mediator: Supply Chain Learning (Internal, supplier and customer)</p> <p>Moderator: Information Sharing</p>	<p>Internal and Customer learning are positively related to flexibility performance.</p> <p>Empirical evidence suggests that information sharing positively improves all three dimensions of supply chain learning.</p> <p>There is no direct positive relationship between supplier learning and flexibility performance.</p>	<p>Information sharing is comprised of information sharing support systems and the information content (Huo et al. 2016; Zhou and Benton 2007).</p> <p>SC learning is defined as the process of the focal firm acquiring, assimilating, and exploiting knowledge across its internal functions as well as from its major suppliers and customers (Huo, Haq, and Gu 2019)</p>
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	<p>Dependent Variables:</p> <p>Flexibility</p> <p>Performance</p>	<p>Supplier learning improves flexibility performance through the full mediation of internal learning.</p> <p>Information sharing enhances the impact of supplier learning on flexibility performance and not on internal and customer learning.</p>	
<p>Baihaqi and Sohal (2013)</p> <p>Context: Australian manufacturing companies.</p> <p>Theory Used</p> <p>Not stated</p>	<p>Independent Variable:</p> <p>Information Sharing Intensity.</p> <p>(Internal integration practices, Integrated information technologies, Information quality)</p> <p>Mediator:</p>	<p>The quality of information is significantly and positively correlated with the intensity of information sharing.</p> <p>There is an indirect impact of information sharing on performance. Therefore, the results of this study suggest that companies need to have excellent internal practices and</p>	<p>Collaboration is considered as one of the core capabilities that companies need in order to remain viable in the current business environment (Bowersox et al. 2000)</p> <p>Internal integration is defined as linking internally performed work into a seamless process to support customer requirements.</p>

	<p>Collaboration</p> <p>Dependent Variables:</p> <p>Organizational Performance</p>	<p>collaboration with their supply chain partners to achieve superior performance</p>	<p>Information quality refers to the degree to which the shared information meets the need of organisations (Petersen 1999).</p> <p>IT fosters companies' communication competencies, especially in disseminating and exchanging information internally and externally with its customers and suppliers (Li and Lin 2006, Paulraj and Chen 2007, Paulraj et al. 2008)</p>
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<p>Baba et al., (2021)</p> <p>Context: Ghana</p> <p>Theory Used Not stated</p>	<p>Independent Variable: Information Sharing</p> <p>Mediator: Supply Chain Collaboration</p> <p>Dependent Variables: Firm Performance</p>	<p>The results indicate that close collaborations within the supply chain network necessitate a greater level of information sharing.</p> <p>The results show that firms with greater levels of information sharing observe an increase in performance.</p> <p>The firms with higher supply chain collaboration achieve higher</p>	<p>Supply chain Collaboration is considered one of the essential abilities that a firm needs to remain in a stable business environment.</p> <p>Firm performance is described as an assessment that is not only based on capabilities and outcomes but also from a competitive market perspective.</p>
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		<p>performance. Thus, supply chain collaboration or integration has a direct influence on Firm performance.</p> <p>Collaboration directly mediates the relationship between information sharing and firm performance.</p>	
<p>Sundram, Chhetri and Bahrin (2020)</p> <p>Context: Malaysian firms</p> <p>Theory Used</p>	<p>Independent Variable: Information Sharing (IS)</p> <p>Information Technology (IT)</p>	<p>The results indicate that implementation of Information Technology, Information Sharing and Supply Chain Integration is significantly associated with both firm and supply chain performance.</p>	<p>IT as a platform for business connections, linking suppliers through the exchange of electronic data, establishing computer-to-computer connections with suppliers as well as systems of information.</p> <p>IS is the ability to handle the movement of information through the supply chain.</p>

<p>Information Processing Theory</p>	<p>Mediator: Supply Chain Integration (SCI)</p> <p>Supply Chain performance (SCP)</p> <p>Dependent Variables: Firm Performance (FP)</p> <p>Supply Chain performance (SCP)</p>	<p>This study also further reveals that supply chain performance has an insignificant effect on firm performance.</p> <p>Information sharing and Information technology have a positive relationship with supply chain integration.</p> <p>There is an insignificant relationship between supply chain integration, supply chain performance and firm performance.</p>	<p>SCI is the level of integration between all processes carried out within an organization and its associated suppliers, partners and customers within a supply chain.</p> <p>SCP is the methodical quantification of processes or concepts within the supply chain.</p> <p>FP is an assessment of the organization's performance not only based on its individual capabilities and results, but also in the context of the market in which it exists</p>
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<p>Sundram et al. (2018).</p> <p>Context:</p>	<p>Independent Variable:</p> <p>Supply Chain Information Management</p>	<p>The results indicate that supply chain information practices are important strategic resources primarily in the manufacturing industry. However, their contribution toward</p>	<p>Supply chain integration is defined as the extent to which all functional activities within an organization, and the functional activities of its suppliers, customers and other supply chain partners, are linked and integrated together.</p>
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<p>Malaysia manufacturing sector.</p> <p>Theories Used: Resource-based View Theory System Theory</p>	<p>Supply Chain Information System Infrastructure (ISI)</p> <p>Mediator: Supply Chain Integration (SCI)</p> <p>Dependent Variables: Manufacturing performance</p>	<p>manufacturing performance significantly depends on the integration of manufacturing firms in the supply chain.</p> <p>Supply Chain Information Management and Supply Chain Information System Infrastructure are positively related to manufacturing performance.</p> <p>Supply chain integration positively mediates the relationship between the two independent variables and manufacturing performance.</p>	<p>Supply chain ISI makes processes, communications and interfaces easier to perform and manage across partners in a supply chain network and in return enhances the capability to reduce logistics lead time.</p> <p>The application of supply chain information management, such as maintenance of long-term relationships among supply chain members (Buzell and Ortmeyer, 1995), cooperating with a fewer number of suppliers in order to cut down on cycle times and chain-wide inventory levels (Davis, 1994), information sharing among supply chain members (Lee and Whang, 2000) and solid commitment across all organizational levels.</p>
<p>Tai and Ho (2010)</p> <p>Context:</p>	<p>Independent Variable: Information Sharing Services</p>	<p>Results indicate that information sharing positively influences CRI and that the characteristics of the</p>	<p>Operational level information is data such as product category, price, and product specification information, which can be shared to facilitate a buyer's decision-making in product purchases.</p>

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<p>China Steel Corporation (CSC)</p> <p>Theory Used</p> <p>Not stated</p>	<p>1. Order information 2. Operational information 3. Managerial information 4. Strategic information</p> <p>Moderator:</p> <p>Trading Relationship Characteristics</p> <p>Dependent Variable:</p> <p>Customer Relationship Intention (CRI)</p>	<p>trading relationship moderate the effects of information sharing.</p> <p>These findings suggest that, while information sharing is an important means of enhancing a customer relationship, not all types of customers should be treated the same way.</p> <p>Right stuff cluster customers value the information shared by CSC and will increase their relationship intention to CSC. This study asserts that the customers in this cluster regarded CSC as a critical source and that CSC's information sharing will strengthen this connection and increase the customer's identification with the company.</p>	<p>Managerial-level information is information on inventory, engineering changes, production schedules and capacity planning that can be shared to allow buyers to effectively plan and schedule their own production processes.</p> <p>Strategic level information is information on promotion plans, sales status for each product category and market forecasts can be shared to help buyers formulate their own strategies (Chopra and Meindl, 2010).</p>
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		<p>The fatal attraction cluster took a positive view towards most of the information-sharing services provided by CSC. CSC's strategic level information-sharing service did not significantly influence CRI and, thus, may not be a critical consideration. This group focused more on order, operational and managerial-level informationsharing services in exchange for CRI.</p> <p>The odd couples cluster showed that information-sharing services provided by CSC correlate positively with CRI.</p>	
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Hsu et al., (2008)	Independent Variable: Information Sharing Capability	Results demonstrate positive relationships between information sharing capability and buyer-supplier	Information sharing in a supply chain context refers to the extent to which crucial and/or proprietary information are available to members of the supply chain.
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United State of America, Europe and New Zealand	<p>1. Information system integration</p> <p>2. Decision system integration</p> <p>3. Business process integration.</p> <p>Mediator:</p> <p>Buyer-Supplier Relationship</p> <p>1. Supply chain architecture</p> <p>2. Relationship architecture.</p> <p>Dependent Variable:</p> <p>Firm Performance</p> <p>1. Overall performance</p>	<p>relationships, and between relationships and performance.</p> <p>It can be inferred that the effect of information sharing capability on relationship architecture is weaker for European firms than for US firms.</p> <p>Model 3 suggests that the effect of the buyer-supplier relationship on a firm's market-based performance is weaker for European firms than for US firms.</p> <p>Results show that business process, information and decision system integration are positively related to supply chain architecture.</p>	Decision system integration provides visibility and reduces uncertainty along the supply chain (Gao et al., 2005)
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	2. Financial performance	Business process and decision system integration positively relate to relationship architecture.	
Chen et al., (2019) Context: Chinese Textile Entrepreneurs Association Theory Used: Resource-based View	Independent Variable: Supply Chain Information Sharing (SCIS) Mediator: Supply Chain Integration (SCI) Operational Performance (OP) Dependent Variable: Business performance (BP)	SCIS has a direct positive impact on SCI and OP. SCIS has no direct positive influence on BP. However, it indirectly affects BP positively through the mediating effects of SCI and OP. The result reveals that the model achieves a full mediation of SCI and OP between IS and BP, thus showing that simply having IS does not lead to improving BP. SCI plays a crucial role in providing a significant direct impact on OP as well as BP. OP is also proven to have a direct positive influence on BP.	SCIS is defined as the IS among internal functions within a firm and IS among supply chain partners during transactions and cooperation, to manage the process in the supply chain (Huo et al., 2014). SCI is a complex concept which emphasizes the linkages among supply chain partners that involve the well-coordinated flow of valuable resources (materials, information and capital) among these parties.

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2.5 Research Model and Hypothesis Development

2.5.1 Information Sharing and Procurement Performance

The effectiveness and efficiency of supply chain performance are best achieved through information sharing (Deghedi, 2014). According to Baba et al. (2021), organizations with high levels of information sharing attain high performance rates in the short and long term. Kong et al. (2004), information sharing assists supply chain parties involved in purchasing processes with thorough material information to safely conduct business and be well informed about market trends. Today, organizations are constantly investing in information-sharing resources to transform and manage how information-shared and learning processes within and outside their organization for better production and operational systems (Lei et al. 2019).

Previous literature suggests that the procurement process should be transparent, bear accurate and precise information for easier decision-making processes and prevent malpractices to achieve set goals (Amemba et al., 2013). Here, the efficient use and sharing of essential information and strategies among departments and other stakeholders, especially in manufacturing firms, reduce the organisation's bullwhip effect (Lee, Padmanabhan and Whang, 1997). The credibility and quality of the information shared are paramount in reducing the distortion of information received within the supply chain (Deghedi, 2014).

From the RBV, organizations need to evaluate and exploit their internal and firm-controlled resources (human, physical, capital, information, and knowledge) to increase organizational performance ((Lavie, 2006; Hernández-Espallardo et al., 2010; Barney, 1991). Hence,

information sharing promotes procurement performance in organizations. It is therefore proposed that:

H1: Information sharing positively influences procurement performance.

2.5.2 Effect of Information Technology Adoption

Information Technology is a critical factor as it has become the foundation for public transaction processes (Rehouma and Hofmann, 2018). Inculcating information technologies into businesses enables new product developments and services that are developed efficiently with precise information about customer demands for long-term growth and success (Büyükoçkan and Göçer, 2018). In the procurement process, the exchange of vital information relating to prices, suppliers, delivery details, inventory and raw materials is efficiently shared among stakeholders with the support of digital technologies for overall procurement performance (Stephens and Valverde, 2013). The dominant argument of RBV is that organizations can identify and willingly exploit their firm-controlled resources (tangible and intangible; internal and external) and deploy digital technologies to enhance performance (Fawcett et al., 2007; Barney, 1997; Davis 1986). Though supply chain management optimizes the flow of goods and materials by sharing and analysing information in transactions (Chen & Paulraj, 2004), its focus is the digitalization of real-time information sharing between systems in the supply chain (Calatayd, Mangan, and Christopher, 2018).

These emerging technologies embodied as Industry 4.0 deployed to leverage the procurement function includes artificial intelligence, big data analytics, robotics, enterprise resource

planning, internet of things, blockchain, cloud computing, and smart contracts among others (Rejeb, Sule and Keogh, 2018). Further, these high-tech technologies accelerate existing procurement tools by automatizing transactional processes as well as enhancing the precision of information to promote strategic decisions in organizations (Rejeb, Sule and Keogh, 2018). These information technology tools increase operational efficiency, innovations, collaborations, flexibility and visibility; improve decision-making, reduce cost and make information sharing easier and faster among stakeholders within supply chains (Toka et al., 2013; Xu, 2014). According to Hallikas, Immonen and Brax (2021), information technology adoption increases the transfer and availability of data within an organization's network.

Drawing on the RBV, it is posited that information technology is more likely to have a strong influence on information sharing within the purchasing functions which promotes procurement performance in organizations. It can be hypothesized that:

H2: *Information technology positively influences procurement performance.*

H3: *Information technology positively moderates the relationship between information sharing and procurement performance.*

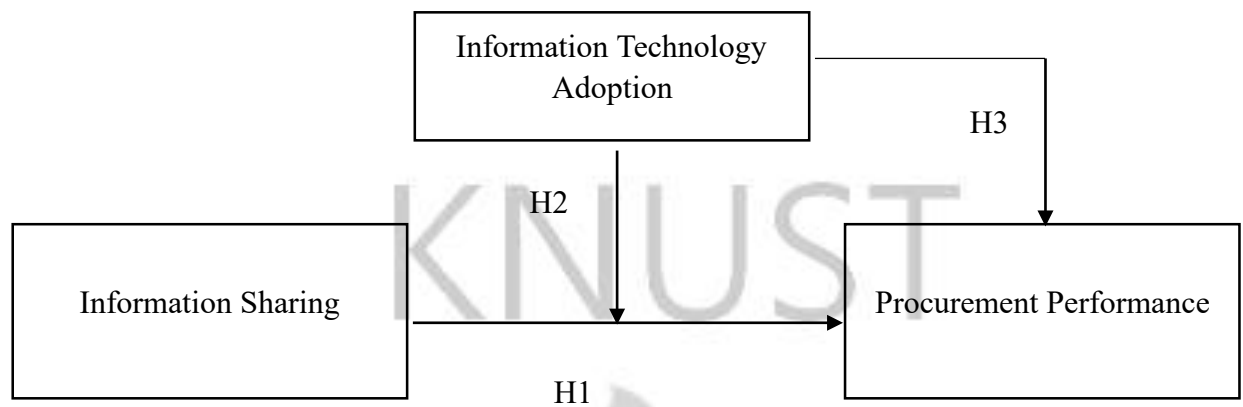
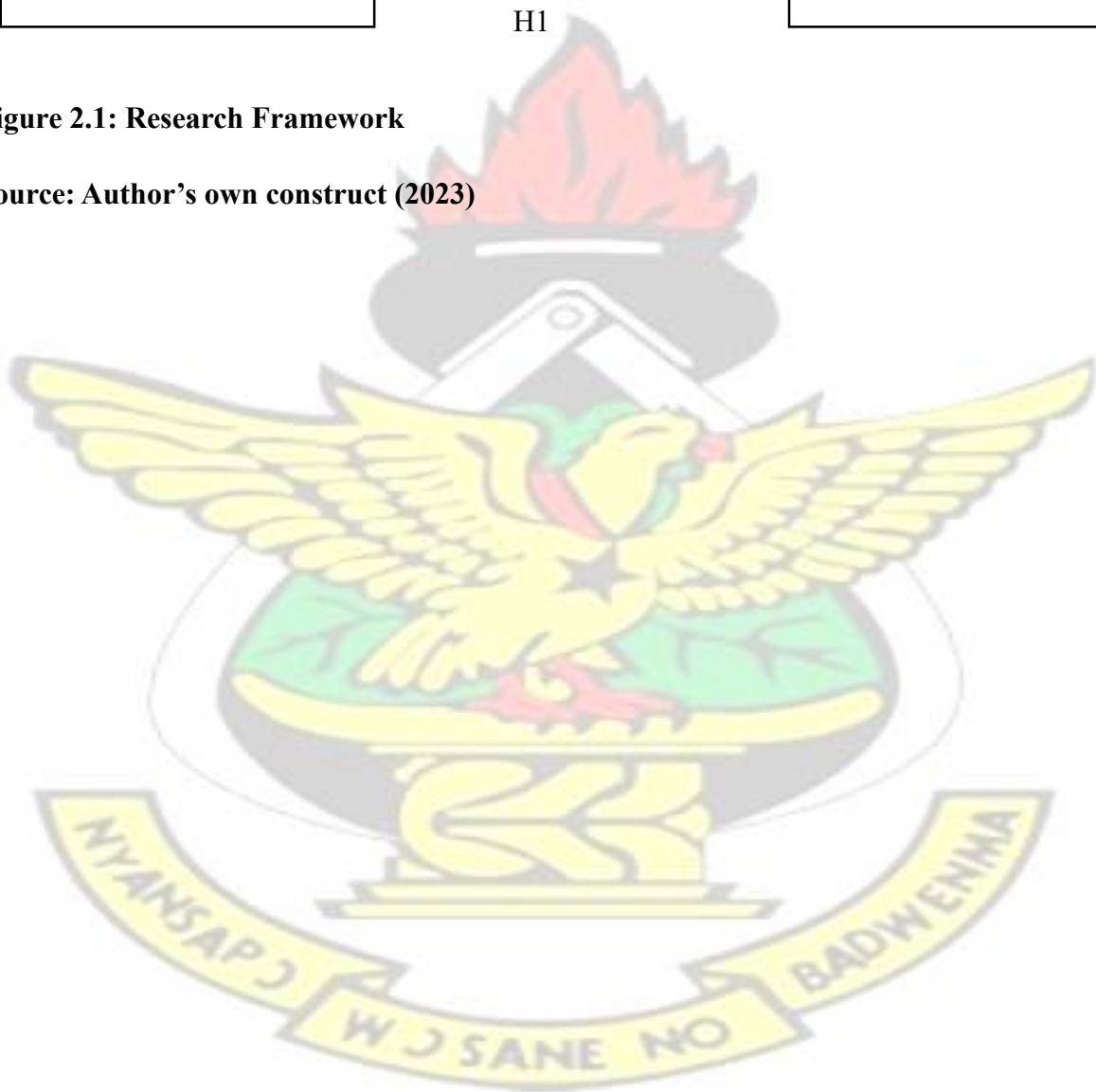


Figure 2.1: Research Framework

Source: Author's own construct (2023)



CHAPTER THREE

METHODOLOGY

3.1 Introduction

Chapter three presents the methodology (ies) that would be implored in this research. This chapter describes the study design chosen for this research, study setting, target population (respondents), sampling technique (s), data collection tools, sample size, analysis and tool for data analysis as well as the researcher's justification for choosing those methods and how they would help to meet the objectives.

3.2 Research Approach and Design

Research design refers to the plan that a researcher chooses to carry out a study to address the problem of a research (Saunders et al., 2009). Broadly speaking, research approach has to do with whether particular research focuses on developing theory based on available evidence (inductive-approach) or testing theory using a suitable piece of data (deductive-approach) (Saunders et al. 2007; Cohen et al. 2007). This study follows a deductive approach as it focuses on testing a theory/model about the nature of relationship between information sharing and procurement quality performance. Deductive approach involves the use of quantitative data and statistical methods and focuses on making inferences based on a sample (Saunders et al., 2007).

Research design refers to the plan for collecting and analysing data (Bryman 2012). Common research designs associated with deductive research approach include cross-sectional (survey) design, longitudinal (survey) design, and experiment (Bryman 2012; Saunders et al., 2017). This study utilized cross-sectional survey design. This design involves collecting data on multiple variables from a large number of cases at a single point in time (Bryman 2012). The present study's use of cross-sectional survey is consistent with prior studies on information sharing and t performance (Janda and Seshadri 2001). Unlike longitudinal survey design and experiment, cross-sectional survey design is less suitable for testing cause-and-effect relationships. Nevertheless, it is adequate for examining the association between variables. Besides, cross-sectional survey design enhances external validity/generalization (Bryman

2012). Longitudinal survey design and experimental design could not be considered in the study due to time and financial budget constraints. Thus, the study used exploratory study design with cross-sectional survey approach.

3.3 Population of the Study

Research population consists of all the cases or group participants in research. (Saunders et al., 2009). Due to the nature of the concepts under examination, it was vital to identify a population that could provide the researcher with all the pertinent information required for addressing the study's aims. Accordingly, the study targeted public organizations in the Northern Regions. As a result, public institutions within Metropolitan, Municipal, and District Assemblies (MMDAs) and other public entities were targeted.

3.4 Sampling Technique and Sample Size

There is no single rule for deciding an appropriate sample size. While it is generally recommended that the larger sample, the better, 'large' samples make trivial effects being statistically significant (Hair et al. 2014). In this study, two factors influenced the determination of a suitable sample size. The first is the complexity of the study's theoretical model in relation to the statistical analysis required to estimate it while the second is the issue of generalization.

It is argued that sample size requirement varies with model complexity, to the extent that complex models (i.e., models were several relationships between variables or independent variables or parameters that need to be estimated) require 'larger' sample size (Hair et al. 2014).

This study's model is a very simple one as it has one dependent variable, and two independent variables.

Hair et al., (2014) propose that a sample size of between fifty and one hundred is typically appropriate to detect a substantial variance described using multiple regression analysis. Also, According to Hair et al. (2014), a ratio of five to twenty cases for each indicator is typically acceptable for the use of multiple regression analysis. This guidance indicates that, per the number of indicators used for this study, a sample of at least one hundred is appropriate in this analysis. For the use of inferential statistics, a sample size of at least one hundred is usually ideal and can allow generalization, assuming the population is defined by the sample (Cohen et al., 2007; Hair et al., 2014). Accordingly, using a ratio of five cases for each indicator, and given 17 total indicators (see Appendix), a minimum of 100 businesses were targeted for the study after taking into account issues of non-response and inaccurate responses.

This study could not use probability sampling techniques due to difficulties in obtaining a comprehensive and reliable sampling frame in Ghana. Considering this, the study used nonprobability approach. Specifically, the study relied on purposive sampling.

When choosing participants at the organizational level, the researcher intentionally opted for a senior management representative, such as general managers, logistics managers, operations managers, from each involved firm. The selection was made based on the consideration that these executives, being both available and willing to participate, possess the necessary knowledge and expertise to provide relevant responses to the central issues of the study.

3.5 Data Collection Method

In line with previous survey studies that have concentrated on senior managers as primary sources of information and were carried out in Ghana, this study employed a face-to-face method of data gathering known as delivery-and-collection. The aforementioned data gathering methodology is not only applicable within the corporate environment of Ghana, but also yields

a substantial response rate. The poor address system and low internet accessibility/penetration rate make mail and internet data collection techniques difficult to implement in Ghana. In line with the studies research purpose and design quantitative primary data, collected using a structured/self-completion questionnaire, were used in the study.

Measures

Information sharing, which is the independent variable was defined as the extent to which the purchasing organization and its key suppliers exchange business information (c.f. Wu 2008),

The study's dependent variable is procurement performance was defined as the extent to which procured items meet specifications and end-user needs (Devaraj et al. 2012). Measures for both dependent and independent variables were adapted from Devaraj et al. (2012). IT adoption was defined as the degree of willingness to use the possibilities offered by information processing related to tasks at the workplace (Rehouma & Hofmann, 2018; Koellinger, 2008). Measures for IT adoption were adapted from Rehouma and Hofmann (2018) and Koellinger (2008). Each item for information sharing and IT adoption was measured with a seven-point scale that ranged from "Strongly disagree (=1)" to "Strongly agree (=7)" while items for procurement performance were measured with a seven-point scale that ranged from "Not at all (=1)" to "To the greatest extent (=7)". Table 3.1 present the measures and their sources.

Table 3.1 Measures

Constructs and Measures	Source
Information Sharing:	<i>Adapted from Devaraj et al. (2012)</i>
Exchange timely information	
Exchange accurate information	
Exchange confidential information	
Exchange complete information	

<i>Information Technology Adoption:</i>	<i>Adapted from Rehouma and Hofmann (2018) and Koellinger (2008)</i>
We use social media tools to facilitate communication	
Our IT system allows the integration of data	
Our supplies can access data from our portal quickly	
<i>Procurement Performance:</i>	<i>Adapted from Devaraj et al. (2012)</i>
reduced the duration of the purchasing ordering cycle	
reduced prices paid for purchases	
reduced errors in purchase transactions	

3.6 Data Analysis

The study employed a quantitative approach to data analysis, utilising statistical methods, due to its explanatory character. Two overarching categories of statistical analysis were performed. The initial phase of research involved doing a descriptive analysis using statistical techniques, namely frequency (percentages) and means (standard deviations). This analysis aimed to generate descriptive findings regarding the demographic characteristics of the respondents and firms, as well as the construct of interest in the study (including measures and composite scales for information sharing and procurement quality performance). The second, inferential analysis, involving the use of correlation and regression analyses, focused on generating results on the relationship between the constructs of interest in the study. The study conducted all analyses using IBM SPSS version 20 and relied on tables and graphs to present the results.

3.7 Ethical Consideration

Ethics can be defined as a set of rules and principles that determine the acceptability or unacceptability, goodness or badness, and rightness or wrongness of individual and organizational behavior within society (Saunders et al., 2007). The study incorporated the application of the subsequent ethical concepts. The participants were provided with a detailed

explanation of the study and were requested to cooperate prior to being asked to complete the questionnaires that were distributed to them. Nevertheless, the study did not offer any assurances to participants regarding the provision of incentives or tokens as a means of encouraging their participation. The participants were additionally provided with the assurance that any data collected from them would be maintained in a secret manner, with no disclosure to third parties for any objectives, whether commercial or non-commercial, whatever.



CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter deals with the analysis of the data. Specifically, the chapter presented the demographic characteristics of the respondents, measurement model analysis, descriptive and correlation results, hypothesis testing results, a summary of results and finally, a discussion of the results. The researchers distributed 150 questionnaires, out of which 91 questionnaires were completed and returned.

4.2 Demographic Characteristics

The result as presented below show that 71.3% of the procurement unit heads were males whilst 28.7% were females. Also, result on the gender of the respondents indicated that most of the respondents were males, constituting 72.7% whilst 27.3% were females. The results on the age of the respondents further showed that most of the respondents were between 30 – 39 years (42.7%), followed by 20 – 29 years (31.5%) and 20.2% who were within 40 – 49 years. A few of the respondents representing 5.6% were 50 years and above. In terms of education, most of the respondents have a diploma/HND, representing 35.3%, first degree represented 32.9%, secondary school or related certificate represented 17.6% and second degree represented 14.1%. This means that almost all of the respondents have had formal education to understand the questionnaire. The results on the managerial level showed that supervisors represented 35.2%, middle managers represented 51.1% and top managers represented 13.6%. Finally, data on the industry type indicated that services represented 44%, mining/extraction represented 15.4%, agriculture represented 16.5% and manufacturing represented 24.2%.

Table 4.1: Demographic Characteristics

Variables	Categories	Count	%
Gender of the head of the procurement unit	Male	62	71.3
	Female	25	28.7
Gender	Male	64	72.7
	Female	24	27.3
Age (years)	20-29	28	31.5
	30-39	38	42.7
	40-49	18	20.2
	50 or more	5	5.6
Education level	Secondary school or related certificate	15	17.6

	Diploma/HND	30	35.3
	First degree	28	32.9
	Second degree	12	14.1
Managerial level	Supervisor	31	35.2
	Middle (manager, e.g., head of the department)	45	51.1
	Top (e.g., CEO, managing director)	12	13.6
Industry	Service	40	44.0
	Mining/Extraction	14	15.4
	Agriculture	15	16.5
	Manufacturing	22	24.2

Source: Field Survey, 2023

4.3 Measurement Model Analysis

Confirmatory factor analysis was used to check for the psychometric properties of the data using LISREL 8.80. The main constructs in the study were information sharing, information technology adoption and procurement performance. At the designing stage of the questionnaire, information sharing was measured using five (5) indicators. Information technology adoption was also measured with seven (7) indicators and, procurement performance was measured with five (5) indicators. The indicators for all constructs were taken through a purification process by which some items were dropped, and others retained. For example, one (1) item was dropped from the five indicators for information sharing, hence the construct was finally measured with four items. Similarly, four items were dropped from the seven indicators of information technology adoption, hence the construct was finally measured with three items. Finally, two items were dropped from the five indicators of procurement performance, hence the construct was finally measured with three items. The CFA table below provides the list of the items that were retained in the analysis for each construct including their respective standardized factor loadings, the Cronbach Alpha (CA), Construct Reliability (CR) and Average Variance Extracted

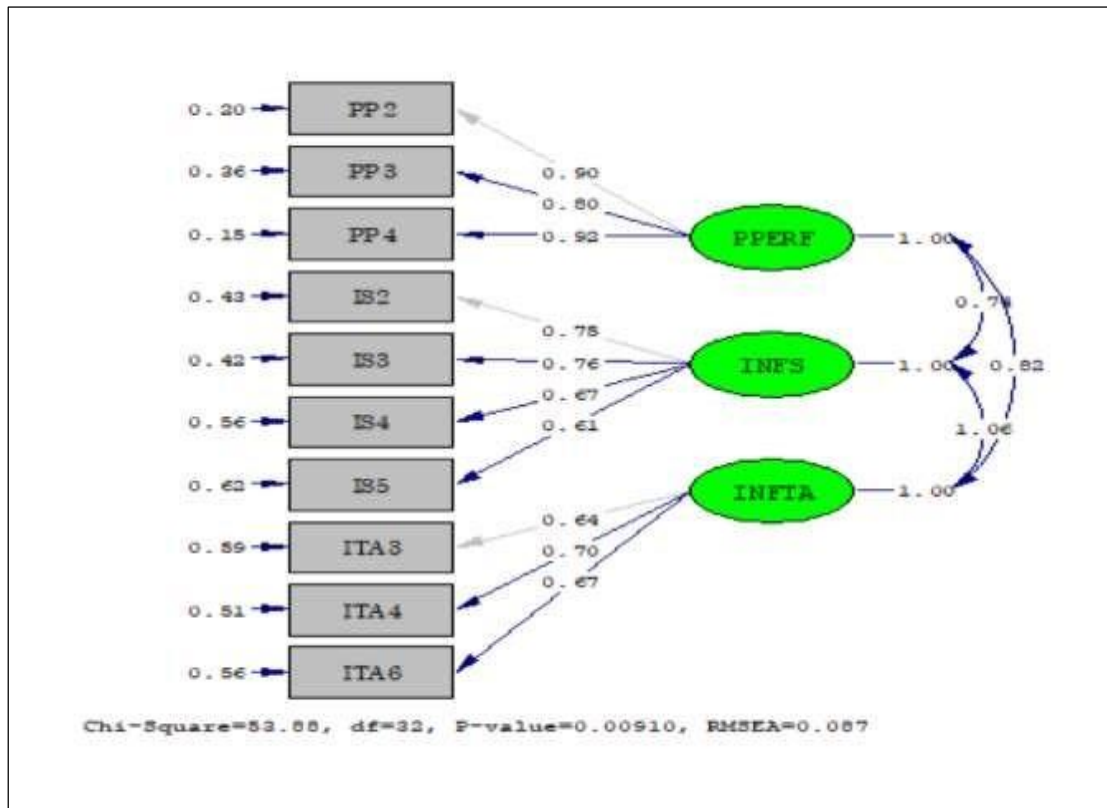
(AVE). All the factor loadings were positive and significant. Likewise, the CA, CR and AVE were all above the minimum thresholds of 0.7, 0.6 and 0.5 respectively. Finally, the CFA model fit indices were good and acceptable (Chi-Square = 53.88; Df = 32; X²/Df = 1.68; P-value = 0.01; RMSEA = 0.09; GFI = .89; CFI = .96; SRMR = .05; NNFI = .95). The indicators and the constructs demonstrated both convergent and discriminant validity; hence, the data can be said to be valid and appropriate for further analysis.

Table 4.2: CFA Results

<u>Constructs and Measures</u>	<u>Estimate</u>	<u>T-value</u>
<i>Information Sharing: CR = .79; AVE = .52; CA = .77</i>		
Exchange timely information	0.75	Fixed
Exchange accurate information	0.76	7.25
Exchange confidential information	0.67	6.25
Exchange complete information	0.61	5.73
<i>Information Technology Adoption: CR = .71; AVE = .58; CA = .62</i>		
We use social media tools to facilitate communication	0.64	Fixed
Our IT system allows the integration of data	0.70	5.91
Our supplies can access data from our portal quickly	0.67	5.68
<i>Procurement Performance: CR = .91; AVE = .76; CA = .89</i>		
reduced the duration of the purchasing ordering cycle	0.90	Fixed
reduced prices paid for purchases	0.80	9.84
reduced errors in purchase transactions	0.92	12.62

Chi-Square = 53.88; Df = 32; X²/Df = 1.68; P-value = 0.01; RMSEA = 0.09; GFI = .89; CFI = .96; SRMR = .05; NNFI = .95

Source: Field Survey, 2023



Source: Field Survey, 2023

4.4 Descriptive Statistics

This section of the analysis presents the descriptive statistics of the items that were used to measure the variable in the study. The variables were information sharing, information technology adoption and procurement performance. All the questions that were asked under each variable were measured on a seven-point Likert scale format where 1 = Strongly disagree, 2 = Disagree, 3 = Somewhat disagree, 4 = Neutral, 5 = Somewhat Agree, 6 = Agree and 7 = Strongly Agree. The interpretation of the average scores for each of the variables is based on this Likert scale format.

4.4.1 Information Sharing

Information sharing was measured using four (4) items. The item which scored the highest mean was “exchange timely and complete information”. This item had a mean score of 5.90 which suggest that on average, a participant in the study agreed that they exchange timely and

complete information. The item which scored the least mean was “exchange confidential information”. This item had a mean score of 5.64.

Table 4.3: Information Sharing

Items	Min	Max	Mean	Std. Dev
Exchange timely information	1	7	5.90	.942
Exchange accurate information	2	7	5.87	.933
Exchange confidential information	1	7	5.64	.972
Exchange complete information	3	7	5.90	.967

Source: Field Survey, 2023

4.4.2 Information Technology Adoption

Information technology adoption was measured using three (3) items. The item which scored the highest mean was “Our IT system allows the integration of data”. This item had a mean score of 5.69 which suggest that on average, a participant in the study agreed that their IT system allows the integration of data. The rest of the items had a mean score of 5.59.

Table 4.4: Information Technology Adoption

Items	Min	Max	Mean	Std. Dev
We use social media tools to facilitate communication	2	7	5.59	1.054
Our IT system allows the integration of data	3	7	5.69	1.035
Our supplies can access data from our portal quickly	1	7	5.59	1.265

Source: Field Survey, 2023

4.4.3 Procurement Performance

Procurement performance was measured using three (3) items. The item which scored the highest mean was “reduced errors in purchase transactions”. This item had a mean score of

5.19 which suggest that on average, a participant in the study agreed that they have reduced errors in purchase transactions. The item which scored the least mean was “reduced prices paid for purchases”. This item had a mean score of 4.98.

Table 4.5: Procurement Performance

Items	Min	Max	Mean	Std. Dev
reduced the duration of the purchasing ordering cycle	2	7	5.15	1.255
reduced prices paid for purchases	2	7	4.98	1.273
reduced errors in purchase transactions	2	7	5.19	1.297

Source: Field Survey, 2023

4.5 Descriptive Statistics and Correlation Analysis

This section of the analysis presents the descriptive and correlation analysis results. The descriptive statistics results as presented in the Table below showed that information sharing had a mean score of 5.857 which suggest that on average the studied organizations scored high on information sharing. Information technology adoption also had a mean score of 5.806 suggesting that firms in the study scored high on information technology adoption. Similarly, the procurement performance had a mean score of 4.921 meaning the firms that were studied scored high in terms of procurement performance. The mean score for firm age was 20.69, which suggests that on average, the firms that were studied have been in existence for 21 years. Lastly, the mean score for firm size was 27.52 which suggests that on average the firms that were studied have 28 employees.

Table 4.6: Descriptive Statistics and Correlation Analysis

Variable	1	2	3	4	5	6
1. Information Sharing	1					

2. Information Technology Adoption	.443**	1				
3. Procurement Performance	.421**	.470**	1			
4. Firm Age	.100	.047	.136	1		
5. Firm Size	.060	-.006	.031	.125	1	
6. Industry	.051	.222*	-.115	.067	-.048	1
Mean	5.857	5.806	4.921	20.69	27.52	-
Standard Deviation	0.752	0.814	1.100	10.409	15.666	-

** $p < 0.01$; * $p < 0.05$ level (2-tailed)

Source: Field Survey, 2023

The results as presented above indicated that information sharing positively relates to information technology adoption ($r = .443$, $p < 0.01$) and procurement performance ($r = .421$, $p < 0.01$). This means that as information sharing is enhanced, information technology adoption and procurement performance will also be enhanced. Also, information technology adoption had a positive and significant relationship with procurement performance ($r = .470$, $p < 0.01$). This means that information technology adoption is enhanced, and procurement performance will also be enhanced. Finally, industry (services) positively correlated with information technology adoption ($r = .222$, $p < 0.05$).

4.6 Hypothesis Testing

The study's hypotheses were tested using PROCESS MACRO model 1. Specifically, the results showed that information sharing positively and significantly affects procurement performance ($\beta = .363$, $t = 2.567$). This means that positive changes in information sharing will result in positive changes in procurement performance. Hypothesis 1 is therefore supported. Also, the study found that information technology adoption has a significant positive effect on procurement performance ($\beta = .607$, $t = 4.499$). This means that positive changes in information technology adoption will result in positive changes in procurement performance. There is

therefore enough evidence to support hypothesis 2 which states that information technology adoption positively influences procurement performance.

Table 4.7: Hypotheses Results

Variables	Procurement Performance	Hypothesis
Controls		
Firm Age	.613 (1.386)	N/A
Firm Size	-.065 (-.201)	N/A
Industry	-.557 (-2.829) **	N/A
Direct Effects		
Information Sharing	.363 (2.567) *	Supported
Information Technology Adoption	.607 (4.499) **	Supported
Interaction Effect		
IS*ITA	.548 (2.480) *	Supported
IS*low ITA	-.083 (-.368)	
IS*high ITA	.809 (3.487) **	
Model Fit Indices		
R ²	.379	
F	8.539 **	
R ² Change	.045	
F Change	6.153 *	

Source: Field Survey, 2023

The third hypothesis (H3) also indicated that information technology adoption positively moderates the relationship between information sharing and procurement performance. The results showed that information technology adoption significantly and positively moderates the relationship between information sharing and procurement performance ($\beta = .548$, $t = 2.480$) and that the effect is even stronger at high levels of information technology adoption ($\beta = .809$, $t = 3.487$). This means that at increasing levels of information technology adoption, information sharing will have a significant positive effect on procurement performance. Hypothesis 3 is thus supported.

4.7 Summary of Results

The table below captures the summary of the hypotheses' results.

Table 4.8: Summary of Hypothesis Results

Hypothesis	Prediction	Results	Evaluation
H1: Information sharing positively influences procurement performance.	+	+	Supported
H2: Information technology adoption positively influences procurement performance.	+	+	Supported
H3: Information technology adoption positively moderates the relationship between information sharing and procurement performance.	+	+	Supported

Source: Field Survey, 2023

4.8 Discussion of Results

The study sought to examine the moderating role of information technology adoption in the relationship between information sharing and procurement performance. The results showed that information sharing positively and significantly affects procurement performance. This means that positive changes in information sharing will result in positive changes in procurement performance. This result was consistent with previous studies. For example, previous literature suggests that the procurement process should be transparent, bear accurate and precise information for easier decision-making processes and prevent malpractices to achieve set goals (Amemba et al., 2013). Here, the efficient use and sharing of essential information and strategies among departments and other stakeholders, especially in manufacturing firms, reduce the organization's bullwhip effect (Lee, Padmanabhan and Whang, 1997). The credibility and quality of the information shared are paramount in reducing the distortion of information received within the supply chain (Deghedi, 2014). From the RBV,

organizations need to evaluate and exploit their internal and firm-controlled resources (human, physical, capital, information, and knowledge) to increase organizational performance ((Lavie, 2006; Hernández-Espallardo et al., 2010; Barney, 1991). Hence, information sharing promotes procurement performance in organizations.

Also, the results showed that information technology adoption significantly and positively moderates the relationship between information sharing and procurement performance and that the effect is even stronger at high levels of information technology adoption. This means that at increasing levels of information technology adoption, information sharing will have a significant positive effect on procurement performance. Literature admits that in the procurement process, the exchange of vital information relating to prices, suppliers, delivery details, inventory and raw materials is efficiently shared among stakeholders with the support of digital technologies for overall procurement performance (Stephens and Valverde, 2013). Further, high-tech technologies accelerate existing procurement tools by automatizing transactional processes as well as enhancing the precision of information to promote strategic decisions in organizations (Rejeb, Sule and Keogh, 2018). These information technology tools increase operational efficiency, innovations, collaborations, flexibility, and visibility; improve decision-making, reduce cost, and make information sharing easier and faster among stakeholders within supply chains (Toka et al., 2013; Xu, 2014). According to Hallikas, Immonen and Brax (2021), information technology adoption increases the transfer and availability of data within an organization's network. Thus, the results collaborate with the RBV theory to indicate that information technology is more likely to have a strong influence on information sharing within the purchasing functions which promotes procurement performance in organizations.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings of the study based on the results presented in chapter four. It also provides a conclusion based on the entire study as well as captures the recommendations of the study.

5.2 Summary of Findings

The study sought to examine the moderating role of information technology adoption in the relationship between information sharing and procurement performance. This section presents a summary of the results. In terms of demographic, the result showed that most of the procurement unit heads were males. Also, most of the respondents were males. The results further showed that most of the respondents were between 30 – 39 years. In terms of education, most of the respondents have a diploma/HND whilst most of the respondents were middle managers. Finally, most of the firms were into services. The sub-sections below present a summary of the main results.

5.2.1 Information Sharing and Procurement Performance

The results showed that information sharing positively and significantly affects procurement performance. This means that positive changes in information sharing will result in positive changes in procurement performance. Hypothesis 1 is therefore supported. Thus, organizations need to evaluate and exploit their internal and firm-controlled resources to increase organizational performance.

5.2.2 Information Technology Adoption and Procurement Performance

The study found that information technology adoption has a significant positive effect on procurement performance. This means that positive changes in information technology

adoption will result in positive changes in procurement performance. There is therefore enough evidence to support hypothesis 2 which states that information technology adoption positively influences procurement performance. Literature admits that high-tech technologies accelerate existing procurement tools by automatizing transactional processes as well as enhancing the precision of information to promote strategic decisions in organizations.

5.2.3 Moderating Role of Information Technology Adoption

The third hypothesis (H3) also indicated that information technology adoption positively moderates the relationship between information sharing and procurement performance. The results showed that information technology adoption significantly and positively moderates the relationship between information sharing and procurement performance and that the effect is even stronger at high levels of information technology adoption. This means that at increasing levels of information technology adoption, information sharing will have a significant positive effect on procurement performance. Hypothesis 3 is thus supported. The results collaborate with the RBV theory to indicate that information technology is more likely to have a strong influence on information sharing within the purchasing functions which promotes procurement performance in organizations.

Theoretical implications

The study draws on RBV to examine the moderating role of information technology adoption in the relationship between information sharing and procurement performance. The findings offer implications for theorisation. First, this study broadens the theoretical framework of the resource-based view theory to encompass the information-sharing paradigm, scrutinizing its correlation with procurement performance. Second, the study also expands the purview of existing information sharing literature by incorporating an examination of the contingent role played by information technology in influencing the relationship between information sharing

and procurement performance. Furthermore, within the framework of the developing economy perspective, this research contributes to the augmentation of the empirical domain surrounding the concept of information sharing and its impacts on procurement performance.

5.3 Conclusion

The study sought to examine the moderating role of information technology adoption in the relationship between information sharing and procurement performance. The study has provided evidence that firms that have adopted information technology are in a more advantageous position to utilize information sharing for the purpose of improving their procurement performance. This indicates that the deployment of technology acts as a catalyst, enhancing the beneficial effects of information exchange on procurement outcomes. According to the findings of the study, the impact is not only observable but also amplified when larger levels of information technology use are considered.

The findings carry significant consequences for both scholarly inquiry and practical application. Academics could expand upon this existing framework to further investigate the mechanisms by which the deployment of information technology improves the synergy between information sharing and procurement performance. Through an examination of intricate details such as the precise technology facilitators, tactics for implementation, and contextual elements that contribute to this phenomenon of moderation, we can enhance our comprehension of the intricate dynamics involved.

These findings provide valuable strategic direction for firms aiming to enhance the efficiency and effectiveness of their procurement processes and achieve desired objectives. Managers and decision-makers possess the ability to acknowledge the significance of allocating resources towards the development of resilient information technology infrastructure, with the aim of enhancing the efficacy of information-sharing methodologies. Furthermore, recognizing that

the influence of information sharing on procurement performance is amplified when sophisticated technological capabilities are present can provide valuable insights for resource allocation and technology integration strategies.

5.4 Managerial Implications and Recommendations

The following managerial implications and recommendations are put forth to harness the synergy between information sharing and information technology adoption to drive procurement performance.

First, the study suggests that it would be advantageous for firms to allocate resources towards the acquisition of advanced information technologies that facilitate procurement procedures. The technologies in this category consist of cloud-based platforms, data analytics tools, and applications of artificial intelligence. The adoption of such technology not only facilitates the efficient exchange of information but also facilitates improved decision-making in procurement.

Also, it is advisable for firms to implement integrated information systems that facilitate the seamless exchange of data throughout the procurement process. These integrated systems offer several benefits, including the reduction of redundant tasks, the mitigation of errors, and the provision of equal access to current information for all relevant parties involved.

Again, it is important for firms to foster a corporate environment that encourages transparent communication and cooperative efforts between procurement teams, suppliers, and other pertinent stakeholders. The utilization of information technology is vital to support the efficient dissemination of timely and precise information, thereby enabling individuals to make wellinformed decisions.

Further, it is imperative for firms to tailor information technology solutions to effectively align them with unique procurement requirements. Comprehensive procurement ecosystems

including different facets, including sourcing, contract administration, and supplier evaluation, have the potential to enhance performance by facilitating enhanced information sharing.

Finally, firms should diligently monitor developing technologies and industry best practices to consistently enhance their strategy for adopting information technology. It is imperative to consistently evaluate the influence of technology on the link between information sharing and procurement performance, and thereafter adapt one's approach accordingly.



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APPENDICES

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI



Procurement Survey, 2023

Dear Survey Participant,

Thank you for considering participation in this study that seeks to understand information sharing and the procurement process among firms in Ghana. The aim of the study is to obtain empirical evidence to advance knowledge and support organisational policy decision on how to leverage procurement to stimulate productivity. Thus, your active participation would be very much appreciated.

The study is undertaken by a team of researchers from Kwame Nkrumah University of Science and Technology (KNUST) School of Business. We can assure you that your responses will be treated in the strictest confidence, with the results collected being anonymised and used for statistical and academic purposes only. Kindly note that you are responding to this survey as a member of the senior management team in your organisation.

The questionnaire has specific instructions to follow and scales to use to indicate your responses. From your personal experiences and your knowledge of your company, kindly provide responses that represent the reality concerning the issues being studied in this research. Although some statements appear quite similar, they are also unique in many ways, **so kindly do well to respond to each statement**. The questionnaire will take about **15 minutes** to complete.

Thank you once again.

Please, indicate your consent for participation here ☐ I agree ☐ I disagree

Section A

>> Based on the respective scales provided, kindly circle a number that best represents your opinion on each statement

Relative to your competitors in the industry, how does your firm perform concerning the following statements (Procurement performance)	<i>Not at all</i>	<i>To the greatest extent</i>						
1. Reduced the cost of processing purchase orders	1	2	3	4	5	6	7	
2. Reduced the duration of the purchasing ordering cycle	1	2	3	4	5	6	7	
3. Reduced prices paid for purchases	1	2	3	4	5	6	7	

4. Reduced errors in purchase transactions	1	2	3	4	5	6	7
5. Increased the conformance of purchase orders	1	2	3	4	5	6	7

<i>SCALE: 1= “strongly disagree” to 7= “strongly agree”</i> Our company and its key suppliers...	<i>Strongly disagree</i>				<i>Strongly agree</i>		
exchange relevant information	1				5	6	7
exchange timely information	1	2	3	4	5	6	7
exchange accurate information	1	2	3	4	5	6	7
exchange confidential information	1				5	6	7
exchange complete information	1	2	3	4	5	6	7

<i>SCALE: 1= “strongly disagree” to 7= “strongly agree”</i> To what extent do you agree with the following:	<i>Strongly disagree</i>				<i>Strongly agree</i>		
Our firm uses of internet to communicate with suppliers	1	2	3	4	5	6	7
We use of e-mails to communicate with suppliers			3	4	5	6	7
	1						
We use of social media tools to facilitate communication	1	2	3	4	5	6	7
			3	4			
Our IT system allows integration of data	1				5	6	7
IT systems are user-friendly	1	2	3	4	5	6	7
			3	4			
Our suppliers can access data from our portal quickly	1				5	6	7
Our technology internet service provider provides an effective network	1	2	3	4	5	6	7

Section B: Firm Background

1. Which of the following best describe your firm-industry?

☐ Service ☐ Mining/Extraction ☐ Agricultural/Agribusiness ☐ Manufacturing

☐ Other.....

2. On average, how long has your firm existed?.....Years

3. On average, how many employees does your firm have?.....

4. What is the gender of head of the procurement unit in your organisation? ☐ Male
☐ Female

Section C: Respondent's Background

Kindly tell me about yourself in terms of

1. Gender ☐ Male ☐ Female
2. Age (years) ☐ 20 to 29 ☐ 30 to 40 ☐ 40 to 49 ☐ 50 or more
3. Education level ☐ Secondary school or related Certificate ☐ diploma/HND
☐ 1st Degree
☐ 2nd Degree or more
4. Number of years working in this firm..... Years
5. Managerial level ☐ Supervisor ☐ Middle (manager, e.g. head of department) ☐ Top (e.g. CEO, managing director)

End of the survey. Thank you once again.

