KWAME NKRUMAH UNIVERTIVERSITY OF SCIENCE AND TECHNOLOGY, KUMASI

The Impact of Information and Communication Technology on Procurement Operational Performance in Fast-Moving Consumer Goods Manufacturing Firms in Ghana

By

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DECLARATION

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

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DEDICATION

This work first and foremost is dedicated to the Almighty God for His protection, guidance, wisdom, favor, knowledge and strength given me throughout the entire findings.

I also dedicate it to my wonderful family, friends and loved ones for their continuous support and kindness.

Finally, I dedicate it to all Procurement students and lecturers. God richly bless you all.

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I am again grateful to my parents, siblings and everyone for their support and encouragement throughout my education. I hope and believe this achievement will be a source of inspiration.

ABSTRACT

In order for organisations to achieve competitive advantage, there is emphasis on the utilisation of Information and Communication Technology (ICT) in their procurement activities. Unfortunately, most Ghana firms have not taken the much advantage of ICT to increase their operational activities. It is on this reason this study seeks to assess the effects of ICT on the procurement performance of manufacturing industries in Ghana. The study adopted both Descriptive and Explanatory research approaches. The population of the study comprised over 350 procurement staff of 6 manufacturing industries in the Greater Accra Region. The sample size comprises 269 employees making up junior, senior and management members. A purposive sampling method was used in the selection of the 269 sample size. Questionnaire was the key instrument for the collection of data. The data collected was analysed using Statistical Package for Social Sciences (SPSS). The quantitative data was presented in tables, charts, descriptive and inferential statistics by the application of Linear regression analysis. The study observed the effects of Communication Technology, Application Software, Electronic Procurement Policy and ICT Technical Support Staff on Procurement Performance in the manufacturing industry in Ghana. Findings from the study indicated that Communication Technology, Application Software, Electronic Procurement Policy and ICT Technical Support Staff contribute positively impacted on Procurement Operational Performance. It is therefore concluded that (ICT) has a significant relationship with Procurement Performance. The study recommends regular training for support staff to adopt proper spend analysis software.

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Abbreviation

ICT Information and Communication Technology

IT Information and Communication

UNCTD United Nations Conference on Trade and Development

SPSS statistical Package for Social Scientist

EDI Electronic Data Interchange

ERP Enterprise Resource Planning

JIT Just -In -Time

SAP System Application and Products

TAM Technology Acceptance theory

TOE Technology- Organisation- Environment Theory

RBVT Resource Based View Theory

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

Without exception, businesses all over the world now rely heavily on information and communication technology (ICT) to facilitate the distribution of their products and services (Ndou, 2004). Effective performance in procurement and supply chain management is anchored by improved Information and Communication Technology (ICT). The rise in the demand for effective and efficient procurement performance towards the strategic performance of organisations cannot be underrated. A recent research conducted by the Forrester Research came to the conclusion that manufacturers continue to depend on the use of ICT for the increased performance on procurement processes in the manufacture sector. They posited that IT improves the supply chain agility, reduced cycle time, achieve higher efficiency and deliver products timely and effectively (Dehgani and Navimpour, 2019). This does not mean to say that the automatic investment in Information Technology in procurement will increase or yield organisational performance (Maraguinic and Granic, 2015). A properly developed IT system does not only increase robust Procurement systems but also allows the organisation to keep track with its customers, suppliers, debtors, and market demands (Wamba et al, 2017).

Public and corporate sectors in both developed and emerging economies need to adopt ICT to not only boost service delivery but also access to the information needed by citizens. To improve efficient service delivery and overall organizational performance, several developed nations have adopted the use of ICT as an application in procurement processes (Kajab, 2010). The implementation of a robust and effective procurement process affects not only a nations development but also improves service delivery and a cost effective operations and price of goods and service.

United Nations Conference on Trade and Development (UNCTD, 2008) found that businesses might save up to 30 percent on operational and other associated costs and 25 percent on other transaction costs by implementing procurement processes using information and communication technologies.

Procurement performance has been considered by many writers as an ongoing and a never ending process. Procurement is considered the nerve centre of all modern organisations whether public or private and also needs to be accompanied by a tight and robust system to ensure performance (Wanyonti & Muturi, 2015). The realisation of the success that comes with ICT powered procurement has open way for developed countries using metricises to indicate how technology has impacted procurement expenditures and performances. Countries such as the United States of America, the United Kingdom, Canada among others are using technology and ICT to tap into and measure procurement performances not only on industries but also healthcare service delivery, crime household income among others (Phillips, 2020). When information and communication technology (ICT) is incorporated into the procurement processes in an industrial setting, it enables the monitoring of results, comparison to benchmarks and best practices, evaluation of the efficacy and efficiency of the processes, control of variables, and straightforward alterations to the processes, should they be necessary (Kerzner and Kerzner, 2017).

1.2 Statement of the Problem

Incorporating Information and Communication Technology in the procurement processes of organisations both private and public is presumed to be a catalyst that is expected to increase efficiency of procurement processes, increase supplier and customer relationship, improved service delivery, improved or increased transparency and accountability and reduces the errors and purchases that are done outside the standard procurement processes (Rok, 2015, Mutagili, 2014). Due to malpractices including political interference, corruption, high prices, and a lack of transparency, governmental and commercial procurement in Africa has been ineffective (Amaeba et al, 2015).

Empirical research demonstrates that the industrial sector is enveloped by various obstacles ranging from legal, procurement, and monetary issues despite the vital responsibilities performed by the manufacture in terms of its economic contribution to the growth of a country (Ogot, 2014). Several studies have shown that difficulties in manufacturing's implementation and use of procurement procedures have a significant impact on the sector's procurement performance and profitability (Moenga, 2011; Osoro 2016).

The use of ICT in the manufacturing industry in terms of procurement is expected to impact accuracy, cost, performance and efficiency to ensure the overall organisational performance in the manufacturing industries.

The biggest problem that confronts the ineffective performance of procurement in the manufacturing industry is the lack of the use of robust Information and Communication Technology in ensuring efficiency, accuracy, and effectiveness that improves cost effective procurement and profitability. Procurement performance and ICT are important to the achievement of information sharing and transparency that improve procurement performance and a total reduction in procurement related costs and performance.

1.3 Research Objectives

The main crux of this study is to access the impact of Information and Communication Technology on Procurement Performance in selected Manufacturing Industries in Ghana. The study seeks to achieve the following specific objectives in to:

1. Evaluate the effects of application software on procurement performance functions in the manufacturing industry in Ghana.
2. Ascertain the effects of electronic procurement policy on procurement performance in the manufacturing industry in Ghana.

3. Evaluate the effect of ICT technical support staff on the procurement performance in the manufacturing industry in Ghana.

1.4 Research Questions

To be able to achieve the objective set for this study, the following research questions have been set to achieve that purpose.

1. What are the effects of application software on procurement performance function in the manufacturing industry of Ghana?
2. What are the effects of electronic procurement policy on procurement performance in the manufacturing industry in Ghana?
3. What are the impact of ICT technical support staff on procurement performance in the manufacturing industry in Ghana?

1.5 The studies significance and Justification

A research conducted by the Government of Kenya in 2014 establishes the fact that the incorporation of ICT in the procurement of manufacturing industries have increased their performance by 42.7 percent in terms of the reduction of cost. Many researches have been conducted on the procurement performance of organisations. However, this study sought to access the impact of ICT on procurement performance in the mining industry in Ghana. Below are the importance and justifications of the study:

First and foremost, the research will assist businesses and business managers in making the best Information and Communication Technology (ICT) decisions to support the implementation of procurement procedures and productivity in the workplaces. This is crucial since studies have shown that ICT has improved organizational performance and profitability by increasing efficiency and profitability.

Second, the study is significant because it will advance academics and theory. This study will act as a starting point for further investigation for students, governments, consultants, and others who are interested in studies in related fields that will incorporate ICT in performance management not only in the procurement of industries but also in the overall profitability of organizations.

Most importantly, businesses and industries have come to the stage where competition is the key to organisational performance and competitive advantage. The implementation of a robust ICT systems in the procurement processes sought to reduce cost and increase quality and performance. This research is important as it will lay out the modalities and bring to the fore why and how organisations are expected to integrate ICT in their procurement processes to ensure reduced cost and performance.

1.6 Overview of Research Methods

Management and procurement personnel from a few Ghanaian industrial businesses make up the study's population. The key sources of data for the study will be used. In order to gather data for the study, a questionnaire will be used. The study's selection of procurement managers, officials, and industry management will use the purposive sampling methodology. The data gathered would be processed via SPSS, a statistical package for social scientists. While analyzing the data, the study will use a quantitative approach of research. Simple percentages, the standard deviation, and regression analysis will all be employed in the study's calculations and will be displayed in tables and graphs. Also, a Cronbach alpha would be performed to determine the validity of the information gathered and examined.

1.7 Scope of the Study

The aim of this study is to evaluate and also conduct a research analysis on the impact of Information and Communication Technology on the performance of procurement among some selected manufacturing industries in Ghana. The scope of the study will be limited to only selected industries within the Greater Accra Region of Ghana.

1.8 Organisation of the Study

There are five (5) chapters in the research. The background of the study, the research problem, the research questions, the importance and rationale of the investigation, the study's scope, a description of the research methodology, the study's limitations, and the organizations under examination are all covered in chapter one. The study's literature review is covered in Chapter 2 of the report. The research approach used to meet the various study objectives is covered in Chapter 3 of the study. The discussion and analysis of the study are included in chapter four. The overview of the study, recommendations, and results are covered in Chapter 5.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Due to rising competition brought about by globalization, businesses are under pressure to boost their service quality, profitability, and adaptability, all while keeping their prices low. The use of technology in their operations is essential if they are to maintain their status as a cutting-edge provider of reasonably priced goods and services. The incorporation of ICT into organizational procurement processes is one example. Organizations can improve their procurement results through the use of ICT by refining their procedures, decreasing the number of mistakes made by humans, and eliminating unnecessary interactions.

This chapter provides a review of related literature that touches on the main thematic issues raised in the research questions guiding this study. It starts by examining what are the importance of Information and Communication Technology entails in the procurement performance of organisations, evaluate the procurement performance function in organisations, ascertain the effects Information and Communication Technology on the Procurement Performance of an organisation and then evaluate some challenges or barriers that confront Procurement function in an organisation.

2.2 Information and Communication Technology

The production, distribution, and dissemination of information about products and services all rely heavily on advances in information and communication technology (ICT). In today's businesses, IT plays a pivotal role in the procurement and supply chain processes (Ndubisi and Iftikhar, 2012). Organizational managers tend to employ technology to cut costs and boost performance and productivity since they are held accountable for the organization's overall performance and profitability (Green et al,

2012). Procurement by electronic means, in its broadest definition, includes business-to-business, business-to-consumer, and business-to-government transactions including the exchange of goods and services, the allocation of resources, and the management of time and resources (Muhia and Afande, 2015). Electronic contracts, data, orders, and sourcing are only few of the many components of ICT that Muhia et al. (2015) elucidate. Hence, they settled on the idea that integrating and standardizing the institution's procurement procedures constitutes an ICT or electronic procurement.

Despite the importance of manufacturing to the nation's economy, research shows that the field is plagued by a wide range of issues (Anzetse, 2016). Challenges in the procurement procedures have been shown to have an effect on procurement performance in the manufacturing sector (Moenga, 2011). IT is a cornerstone of effective procurement service delivery. The presence of communication technology components in an organization, the extent to which the components are used in the day-to-day administration of the organization, and the benefits that come with using these components are all indicators that ICT is available in an organization, according to research by Sirilak et al. (2010).

2.2.1 Application Software

Electronic Data Interchange (EDI) is a technique based on agreed standards that facilitates business transaction in the standard electronic form and in a very automated manner as directed from one computer application to an application on another computer, as per research by Lysons and Farrington (2012). Companies can engage in electronic commerce thanks to a directory detailing the data elements and codes associated with the message standard in use. ASC1*12 and EDIFACT are the two most widely used EDI standards, while there are many others (Lyson and Ferrington, 2012). The EDIs were enabled by the United Nations in 1985 for providing EDI standards that is expected to aid and support World Trade (Nicholas Chegeh et al, 2018).

An ERP system is a unified database for managing business operations, as defined by Nicholas et al. (2018). Enterprise Resource Planning (ERP) is a suite of software that helps businesses re-engineer their operations.

In the study on procurement and supply chain management, Monczka, Handfield, Giunipero, and Patterson, (2015) noted that electronic data interchange (EDI) had largely replaced paper-based methods of conducting business transactions, leading to more efficient record-keeping, retrieval, and exchange of information between companies. Since prospective suppliers are typically informed of reorder levels, they can react quickly when inventory is needed, cutting down on lead times. In the long run, this will help cut down on inventory costs and facilitate the implementation of a JIT (Just-In-Time) strategy, both of which will lead to improved customer service.

The use of emails forms part of the ICT usages in enhancing organisational function and procurement performance. Sending a message from one computer user to another is known as "emailing." Internet utilization has a considerable effect on procurement efficiency since it is quick, flexible, and secure. Mohammed et al. (2012) did related research in which they examined the effects of I.T. on the competencies and performance of the supply chain of dairy products in Fars Province; in this study, emails were utilized as one of the communication tools in the supply chain. According to the findings, sending a well-written email to all of the vendors at once is preferable to making individual phone calls.

Telephony, which includes both the telephone and the technology used to convert human speech into electrical signals that may be communicated over wired or wireless networks to another telephone, which then plays back the transmitted audio for the recipient. To facilitate direct interaction between people in different locations, the telephone is used as an ICT tool. Calipinar et al. (2012) conducted a study in which electronic means of procurement (e-procurement) were employed to enhance service

delivery. The telephone help in the communication with suppliers, placing orders and to receive quotations, prices and the mails for receiving proposals.

2.2.2 Communication Technology

The purpose of allowing communication technology as part of the independent variable is to allow the flow of information. Supply chain and production efficiency can be greatly enhanced by the free flow of information. According to Sirilak et al (2004) study, businesses can evaluate the extent to which they leverage communication technologies throughout the acquisition of goods and services. Emails could be used as one of such. The use of emails involves the transfer or receipt of messages from one computer to the other by the use of a computer is cheap and more convenient than the use of other mediums in the transfer of same. The use of email has since been used as one of the supply chain tools.

In recent years, procurement has embraced the use of telephones and mobile devices as means of making the most of information and communication technology (ICT) for maximum effect. Calipinar et al. (2012), authors of a study on the effect of information and communication technology on procurement performance in Turkey, found that technologies like the telephone and mobile phones are employed in the procurement procedures to improve performance.

2.2.3 E-Procurement Policy and Ghana's Procurement Policy

The Public Procurement Act 2003, (Act 663), was enacted to regulate the purchase of goods and services in all organisations. The purpose of the Procurement Act in to increase value for money increased transparency, efficient and in a fair manner. The value for money under the act is expected to be achieved by the government. Private corporate organisations are expected to put into place proper measurements to live by the standards set by the act and other international best practices all over the world. Value for money in government purchases prompted the passage of Ghana's Public Procurement Act (PPA). The objective of the procurement system is to acquire goods, services, and works at the proper quality, price,

time, and location through a transparent and competitive bidding procedure. Industrialisation is a critical aspect of the developmental needs of every country. Prudent supply chain management in the industrial process has the capacity to increase profitability and improved service.

Because ICT has been incorporated into the supply chain management process, there is the need for organisations to ensure that they have in place electronic procurement policies that will govern how electronic procurement processes are done. It must cover what governs the management of records and ensure that there is effective and efficient dissemination of information in the procurement process for performance. The need of an electronic policy by the organisation is to make sure that the sanctity of the all records in the procurement process are kept. The policy position of the organisation is also expected to tackle the contents of all invoices, put mechanisms in place to ensure that the invoices as issued reflect the genuine supplies undertaken for the purposes of audit. Another important area the policy must result include the those controlling the exchange of data between systems (Jangra et al, 2020).

In spite of the advantages of implementing an electronic procurement policy, they could also hinder the procurement processes of an organisation when not properly done or implemented. A properly drafted and implemented electronic procurement policy is critical in ensuring that it gives clear guidelines as to an absolutely effective and robust procurement policy. The concept of electronic procurement policy has brought many advantages and importance to procurement as an area of study. These areas include effective purchase procedures and processes, the protection and safe sustainability of the environment, improves the risk management ability of an organisation, and greater social inclusion among others (Talluri, 2008).

The Ghanaian ICT sector lacks proper National Electronic Procurement policy to regulate supply chain systems powered by ICT. The improvements that have come over the years has been as a result of the reengineering's undertaken by the private sector and some few government institutions. Until recently,

the introduction of the Public Procurement Authority by an Act of Parliament has gone a long way in the sanitisation of the Public Sector procurements.

2.2.4 Technical Support Staff

The evaluation of the Technical Support staff in the administration and management of ICT is very critical in the management of the its infrastructure. The technical support staff of an ICT organisation includes the developers of that infustructure, designers of the system, the various generic users and administrators of the system. Hamada (2012) conducted a study regarding the influence of information communication technology on supply chain management. It also looked at the various challenges that confronts the sector. The study took into consideration the case of General motors in Eastern Africa. The study concluded as a finding that the unavailability of interest among management in the use of ICT is one of the major reasons and factors that is affecting the success of the use and implementation of ICT and its impact on procurement processes in an organisation.

2.3 Importance of ICT to the procurement performance of organisations

The performance of organisation has been classified as the sole responsibility of managers. Due to this task, managers of organisation are in constant pursuit for what processes and mechanisms are able to reduce and ensure profitability and competitiveness (Green et al 2012). The introduction of ICT in procurement processes is considered as one of such functions that ensure efficiency and cost effectiveness (Hallyburton 2013). The use of ICT in procurement ensures the smooth exchange of information and knowledge through the use of Exchange Planning Systems (Govindan et al, 2014). The sharing of information through the use of ICT in the procurement process. Its efficient usage has the capacity to help reduce cost and increase gains in supply chain and procurement management (Stock, Boyer and Harmon, 2010). In a research conducted by Wong et al (2011), they concluded that organisational success first depends on the performance of supply chain and procurement processes in

place and that such procurement processes function more effectively and profitably when they are powered by Information and Communication Technology (ICT).

The primary goal of a "spanning ICT capability" is to maximize the combined efficiency of "inside-out" and "outside-in" ICT resources (Kraaijenbrink, Spender & Groen, 2010). This kind of coordination is useful for the consistent execution of the organization's procurement strategy (Petitgout, 2018). Collaborative supply chains benefit greatly from the use of information and communication technology (ICT) resources in improving operational and competitive performance (Fawcett et al., 2019). In their conceptual research, Lau, Tang, and Yam (2010) stated that ICT and Procurement Management collaborated to build digitally enabled Procurement, and they identified several research opportunities in ICT and procurement performance interactions. When all involved parties in a complex ICT and Supply Chain have access to equivalent levels of IT infrastructure, they are better able to coordinate with one another (Ritzhaupt et al., 2013). According to Sheffield (2019), there are pros and cons of incorporating ICT resources into supply chain management. Supply chain management and design have emerged as a prominent operational paradigm because to advances in information and communication technology (ICT). Companies have opted for online communication platforms due to the complexity of supply chain management. One way the Internet improves the quality of business interactions with customers is by facilitating more two-way communication (More &Basu, 2013). This exemplifies the shift in the supply chain towards B2B social networks. In procurement management, the focus is on how everyone in the supply chain may profit in the long run via open communication and coordinated action. That ordering variability is a major contributor to the role of ICT in procurement performance is confirmed (Prajogoand Olhager, 2012).

Many writers on the impact of ICT on procurement performance have elaborated the effect of paperless transactions that come with ICT (Verma and Khan, 2014). In the study of the impact of ICT on procurement performance, Verna and Khan (2014) came to the firm conclusion that ICT have had the

impact of paperless transaction on procurement processes. This was achieved by the adoption of System Application and Products (SAP) in the processing of data with the aid of using Enterprise Resource Planning (ERP), and the use of Automatic Identification and Electronic Data Interchange modules. The use of this ITC platforms in procurement performance guarantees transparency, cost effectiveness and security of the system for both the user and the business as a whole.

Another study conducted by Nair (2013), compared the role played by ICT tools in procurement performance in his title "E- supply chain management using software agents". According to the results, ICT improves communication, lessens or eliminates supply chain risks, and boosts productivity by facilitating the systematic and methodical completion of activities and the timely delivery of relevant data to decision-makers. The study's findings on enterprise resource planning (ERP) pointed to the need of ICT in integrating suppliers and customers to guarantee the adequate quantity and quality of products are supplied.

Similarly, Bertschek et al. (2013) found that e-procurement was one of the most talked-about topics in supply chain management and had completely rethought the mechanics and methods of procurement in organizations, as the internet had become the primary source of information, products, and services. The use of ICT according to the research has significantly improved both public and private service delivery, increased access to information and civil society participation the supply chain space.

2.4 Procurement Performance

Procurement as a function of supply chain management has significantly evolved over time. From the initial stages of performing procurement functions in organisations, it was considered as a mere clerical duty where every administrative officer could be assigned the duty. It was the research conducted by Porter (1980) which compelled management of organisations to think of the function as a strategic tool. Porter proposed a five function model which prove supplier and buyer power for competitive advantage of an organisation.

Procurement performance is how we quantify products based on its quality, how transparent, effective and efficient the process is. It measures how well a firm's procurement function achieves set of goals and objectives (Sabiiti et al, 2011).

Many modern organisations see procurement performance as the backbone of the organisations success as it is the avenue through which the organisation purchases goods and services competitively. Loss in profitability has typically resulted from the delivery of substandard products at inflated rates, both as a result of poor procurement performance in the private and governmental sectors. According to Migai (2010), a major barrier to private sector growth is poor procurement delivery, which causes goods and services to be delivered late, reduced in quality, with an increase in defects, or not delivered at all (Barsemoi et al, 2014).The research also indicated both private and public sectors have faced problems with procurement performance due to incompetent staff, the inability to embrace e- procurement, sticking to traditional procurement processes and also lack of quality assurance.

What allows modern organisation to achieve the benefits that come with procurement performance is the ability to properly align the procurement objectives to the overall organisational objectives. Arthur (2009) observed that procurement departments tend to be self-critical in regard to the current inconsistency in their measurement criteria. Procurement performance has a by and large must be consistently reengineering existing work and the processes that must be involved such as the use of ICT with the potentials of removing redundancies, and all bottlenecks that will remove inefficiencies (Bajjaly, 1999). The use of ICT in procurement processes increases the service provision, satisfaction, lower costs and increased levels of supplier relationships (Presutti, 2008). This implies that without strategic incorporation of ICT and other enabling tools in the procurement process to increase procurement performance, organisations tend to decrease their profitability, increased cost of production and high prices of end products. The use of ICT in procurement processes has been considered as a

strategic tool in ensuring increased procurement performance and organisational performance and profitability.

The time it takes to get anything from start to finish, including putting in a bid, getting awarded a contract, placing an order, waiting for it to arrive, and paying for it (Harland et al, 2007). Lead time is the period between when an order is placed and when the company actually receives the goods (Silver et al, 2008). Procurement performance is bolstered by reliable and consistent performance from suppliers (Dey et al, 2015). According to studies conducted by Ideet et al. (2014), an organization's procurement performance and supply levels can benefit from enhanced access to information or information about the procurement function made possible by information and communication technologies.

In a related research conducted by Harland et al (2007), ICT as an independent variable was measured against dependent variables for procurement performance such as lead- time, transparency, contract management performance and supplier performance. Lead time is the period between when an order is placed and received. Improved Supplier performance indicates improved procurement performance (Dey et al., 2015). Supplier performance will be measured based on the timely delivery, service levels, conformance to specifications and flexibility in responding to unexpected changes in demand.

2.5 Theories

There are many theories underpinning the concept of the impact of ICT on Procurement Performance. In terms of relevance to this study, the following theories have been reviewed for the purpose of the study.

2.5.1 Technology Diffusion Theory

The concept of Technology Diffusion Theory first surfaced in the early 1900's by Gebriel Tarde and then later in the 1940's and by Rogers in 1995 when he gave a definition of Diffusion to mean the processes by which creativity is transmitted or transferred over a period of time to other social systems.

What this means is that the transmission and creation of diffusion comes with the either a deliberate or accidental involvement of innovation and new ideas. This theory therefore allows for continual changes and innovation in the process of transforming the organisational processes of production, distribution and exchange of goods and services (Rogers, 1995). In order to achieve the innovation required for the technology diffusion theory, Rogers (1995), posited 5 steps that must be taken. They include; implementation, persuasion, Decision, confirmation and Knowledge.

2.5.2 Technology Acceptance Model (TAM)

The Technology Acceptance theory (TAM) was developed to elaborate on and explain the mechanisms that are available for explaining user's acceptance and the new technological infrastructure. It is a model to demonstrate user acceptance of the use of computer and computer applications (Davis, 1993). The theory demonstrates two characteristics which are the fundamental determinants to show a user's attitude regarding using a new technology. They are the usefulness of the technology to the user and also the perceived ease of use of the new technology that is being implemented. Technology Acceptance Model also demonstrates other factors outside the organisation that affects the ability of the user to effectively use the new model.

2.5.3 Technology- Organisation- Environment Theory (TOE)

This theory was propounded from the concept of evaluating the generic set of factors which predicts likeliness of a technology when it is being introduced to be used by potential users.

This theory takes care of three components; technology, organization and the environment. Technology talks about how well one can combine other functionalities with existing systems to have an ease of use. Organization talks about the in-house context where the technology is operational, which we put into consideration factors such as the size of the organization, its resources available and its culture. Environment looks at the outer peripheral where it operates.

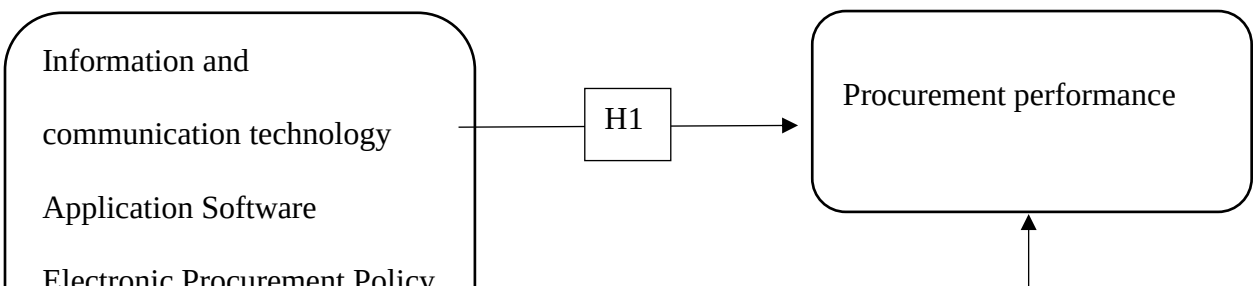
2.5.4 Resource Based View Theory

According to this school of thought, an organization's resources are what give it an edge over other businesses. How well a company handles these resources is a key factor in giving it an edge over rivals in the marketplace. Wernerfelt (1984) first proposed this hypothesis, and his research found that a company's competitive advantage depends on how well it makes use of the resources it already has. Thus, it is crucial that every business's resources be handled critically so as to have an advantage in the cost and saving side of the organization. When properly implemented, loss prevention thanks to well-managed resources can be achieved in any sector of a business.

2.5 Conceptual framework

Conceptual framework is seen as a research tool that is used in the process of a research by a researcher in order to understand the situation under scrutiny (Smyth, 2004). The use of a conceptual framework allows for a simple interpretation and understanding of research work and a good communication of both independent and dependent variables. The study being undertaken has procurement performance as its dependent variable and Information and Communication Technology (ICT) as its independent variable. A mediating variable of information sharing was introduced. This variable could mediate the relationship between ICT and procurement performance. Effective use of ICT might enhance information sharing within and between organizations, leading to improved coordination, faster decision-making, and ultimately impacting procurement performance positively.

Figure 1, illustrates the conceptual framework of the study.



Moderating Variable

Figure 1 Conceptual Framework.

2.6 Conclusion

The review outlined the key areas of literature that may enhance an understanding of the impact of Information and Communication Technology on procurement performance. The effects and some challenges that confronts the subject matter. It focused on that ICT is regarding procurement performance. Other areas such as the use of mobile devises, internet connectivity, software among others were reviewed. The succeeding chapter shall look at and discuss the methodological approach this study adopts.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The methodology demonstrates how the research was carried out. This chapter explains the stages through which the research went through. Research methodology was defined in the works of Saunders et al (2007) as the various techniques and processes that are employed and adopted in order to have a study accomplished. In a study by Sekaran (2010), it was pointed out that the most critical part of a research work is to device a strategic tool in accomplishing a research work. This chapter will cover the research paradigm, the purpose of the study, sample techniques, data gathering techniques, data analysis techniques, the caliber of the study, ethical considerations, and potential limits.

3.2 Research Paradigm

Research Paradigm has generally been defined by many researchers and writers in different ways. Some see research paradigm as the various patterns that are considered in undertaking a research. It also

provides specific guidelines and processes by which the study is expected to be accomplished (Weaver and Oslon, 2006). By standardizing the boundaries within which research in a certain field must be conducted, research paradigms help to expedite the research process. Saunders et al. (2007) conducted a study in which they articulated the idea that a research paradigm can be used to explain a phenomenon. A research project's paradigms may be purely qualitative, purely quantitative, or a hybrid of the two. The use of qualitative research methods entails interpretation of opinions, explanations, elaborations, and illustrations in the course of a research work (Saunders et al 2007). Quantitative research method is generally defined as the use of mathematical and numerical research tools in explaining a research work. It entails the use of statistical models in giving understanding to a research model (Alianga and Gunderson, 2000). Mixed research is most often than not considered as a hybrid method of research where the researcher combines both qualitative and quantitative research methods in an analysis. It normally begins with a qualitative method before the tools of quantitative research. When doing a mix research project, it is common practice to use a combination of qualitative and quantitative research methods. In order to evaluate the effect of ICT on procurement performance in Ghana's industrial industries, the researcher opted for a quantitative research approach. SPSS was used for the coding of the questionnaires. Simple regression and the dependability of the analyzed variables were employed as quantitative tools in the analysis. making use of numerical representations, tables, and statistics.

3.3 Purpose of the study

In a research work, the expected result determines what research tools and methodology are employed. The researcher could use methods that conform with explanatory, descriptive or exploratory in nature. Whatever method that is employed is dependent on the set objectives to be achieved. Descriptive methods are used in a research in the gathering of information about a phenomenon so as to give a good description of a circumstance (Saunders et al, 2009). It helps when the research is about giving a vivid profile of a person or a phenomenon. The explanatory research is those in which the researcher tries to

find out to what are the underlining issues that confronts a phenomenon in order to be able to question the situation and tease out the answers (Robinson, 2002).

To be able to achieve the impact of Information and Communication Telecommunication on Procurement Performance in the Manufacturing Industry in Ghana, the researcher adopted the use of explanatory research for the purpose. This is so as the researcher will seek explanations and interpretations of the various data that will be available in the study. The use of explanatory research thus gives vivid interpretation to the statistical and mathematical values that will be available from the Statistical Package for Social Scientists (SPSS).

3.4 Sampling Procedure

Several authors have proposed various definitions of sampling. Sampling is the process of selecting a representative subset (a sample) of a population to collect data from and draw conclusions about the entire population (Bhattacherjee, 2012). Research sample selection can also be thought of as the process of selecting a subset of a population from which to draw conclusions about the entire population. When compared to a census, the sample's predictive power is far higher (Henry 1990). So, the study discuss about the study's target population, the size of our sample, and the methodology we used below.

3.4.1 Population and sample Size

The population of a research is seen as the total number of objects under the study from which a possible similar observation could be made and it being of the same kind. The population of this study is made up employees in procurement departments, IT, finance and Management of Unilever Ghana Limited, Kasapreko Company Limited, Guinness Ghana Limited, Fan Milk Ghana Limited, Ghana Textiles Print (GTP) and GHACEM. Hence, the sample size is the chosen subset of the population that is assumed to be statistically representative of the whole (Saunders et al, 2007). To accomplish these goals, we use a

purposive sample strategy to contact specific individuals in the aforementioned departments and get their feedback. In order to collect data for the study, we handed out 350 questionnaires to our staff.

3.4.2 Sampling Technique

Methods used to select a study's sample, or "sample," are known collectively as "sampling procedures" (Kothari, 2004). Probability sampling and nonprobability sampling are the two most common types of sampling utilized today. In probability sampling, the likelihood that a given member of the population will be chosen is greater than zero. Systematic sampling, random sampling, and stratified sampling are all ways to generate probability samples. The researcher used purposive sampling, often called subjective sampling, for the study. It is a type of non-probability sampling in which researchers use their own discretion to select participants from the public. (Bhattacherjee, 2012). Due of the low response rate in several of the studied industries, this strategy has been implemented. Participant selection was left up to the researcher's discretion.

3.4.3 Sources of data

Saunders et al. (2007) describe data as "the aggregate of information used as a basis for analysis or as a point of comparison." In this context, "sources of data" means both the reliability of the source and the accuracy of the information it provides. Primary and secondary sources are both viable options for gathering information.

Information is gathered mostly from clients via questionnaires. The data analyzed in this study are first-hand accounts provided by the company's clientele.

Data from secondary sources are those that have previously been collected and used in other studies. Articles, manuscripts, journals, textbooks, the internet, and other kinds of publication are examples of secondary sources of data. The researcher consulted many print and digital periodicals, books, and articles to compile the data shown here (Saunders et al 2009). Primary sources were used for data in this investigation.

3.5 Data Collection

Data collection talks about how information is gathered for the study at hand. There are various ways of information gathering such as interviews, records available, questionnaires and other forms.

To be able to achieve the objectives set for this study, the researcher made use of questionnaire to solicit for information from the respondents for analysis. The questionnaires were administered to staff of the selected industries within the Greater Accra Region. The departments include management, procurement department, finance and IT staff of the organisations. The questionnaire serves as a primary data collection for the study. Selected employees were administered with both open close ended questions for the purposes of the study. Since questionnaires are the most reliable way to conduct a field survey of this kind, we employed them. Consumers were selected at random, as all current customers are considered to be eligible participants. To save time, questionnaires were implemented. It works well for the study since it allows researchers to question participants in depth and get the answers they need.

3.6 Data Analysis

The questionnaire data was analyzed critically to draw conclusions. Data was evaluated by looking at how different respondents answered the surveys. Before performing the analysis, the researcher coded all of the surveys using Statistical Package for Social Scientists (SPSS) software. The descriptive portion of the study was laid up in the form of tables, charts, and graphs, as well as frequency distribution tables. To determine how information and communication technology (ICT) on procurement performance in Ghana's manufacturing sector, a regression analysis was carried out. The variables in the study were also characterized by means and standard deviation analyses. The Cronbach Alpha was calculated by the researcher after he or she conducted a reliability test.

3.7 Quality of the Research

The quality of the results, the accuracy of the data, and the variety of responses that can be obtained all hinge on how the questions are framed. This is because reliable data can only be gathered from respondents if they are asked relevant questions. When data collection is consistent, it can be verified by asking a trustworthy inquiry (Saunders et al, 2009). The data were analyzed using a Cronbach Alpha coefficient to determine their consistency. The work was evaluated for dependability using a Cronbach Alpha coefficient to guarantee uniformity in the measuring of the scale. Cronbach's alpha is a statistical measure of the reliability of the scale. It allows a researcher to check if the questionnaire's scales make sense. The scale's Cronbach Alpha coefficient needs to be 7 or higher (De Vellis, 2003). Regression analysis, mean and standard deviation calculations, and a representative census sample were all used to confirm the accuracy of the results.

3.8 Research ethics and Limitation

Research ethics must be rigorous. Ethics is the study of right and wrong conduct. When conducting research, it is important to follow a set of guidelines established by the field of ethics (Struwing and Stead 2001). Dishonest practices include fabricating data, plagiarizing others' work, omitting to give

proper credit to respondents and other participants, misleading others, and reporting fabricated findings are all prohibited by research ethics (Saunders et al, 2003).

The researcher took into account all of the responses in the questionnaire. The authors have given proper credit to everyone whose work was consulted. We can therefore conclude that the research was conducted in accordance with the highest standards of integrity. Because of this, the research may be trusted and has no traces of unethical behavior.

3.9 Organizational Profile of Fast-Moving Consumer Goods in Ghana

The FMCG sector in Ghana is a thriving industry that encompasses a diverse range of products, playing a crucial role in the nation's economic growth. Characterized by a dominance of informal retail, the sector is witnessing a growing penetration of modern retail formats driven by rising disposable incomes and consumer preferences. Ghanaian-made FMCG products are gaining popularity due to their local sourcing, cultural relevance, and affordability. Evolving consumer preferences for health-conscious, environmentally friendly products are influencing demand, while technology is transforming the sector through e-commerce, mobile payments, and data analytics. Despite challenges such as infrastructure constraints, counterfeiting, and regulatory complexities, the FMCG sector in Ghana holds immense potential for growth, fuelled by a growing population, rising disposable incomes, and increasing urbanization. The FMCG sector in Ghana produces goods and services that have a life span of three years for durable goods and less than three years for such goods that have a life span of less than three years. They are termed as nondurable because these products are expected to be consumed immediately and their shelf life being very short. Many of this products are sold at retail shops, grocery shops, stands, super markets among others. Examples of this FMCG products include Coca cola, malt, fun milk, alcoholic beverages among others.

Products in the fast moving consumable goods in Ghana Sub Sector are categorised into processed foods, beverages, baked meals, frozen and other related foods, prepared meals, cleaning products, cosmetics and medicines among others. The FMCG sector is seen as one of the main sources of employment for the semi skill and unskilled segment of the country's population. The FMCG sector does not only have high annual turnover in the sales of goods and services, it also has a very competitive market environment. Because of the large volumes of sales that are recorded among the FMCGs, it is considered as a reliable source of revenue as the products are daily consumables. Because the taste of consumers in the sector keep changing towards new products and services, operators of the sector sees innovation and the use of technology as a strategic tool to remain relevant, competitive and profitable. Companies that can adapt to changing consumer trends, effectively leverage technology, and address infrastructure and regulatory hurdles are well-positioned to succeed in this dynamic market.

Marketing and packaging of the goods and services that are produced in the FMCG sub sector is very critical in determining the ability of the organisation to remain profitable. Companies in this category spend their efforts and energy on marketing these consumable goods. This makes packaging a very important factor in the production of the goods in this category. The logistics and distribution systems often require secondary and tertiary packaging to maximise efficiency.

The use of internet connectivity and technology has become the main driving force of production and sales in the sector. Many of the manufacturing companies that undertake large volumes of FMCG employ technology to reduce cost and also increase productivity and efficiency. Many of the consumers of the FMCG are now internet based. As a result, these shoppers across the globe use the internet in the purchase of their goods and services. This is because the use of the internet gives them a great deal of comfort and convenience. The online market for groceries and the other consumable products is growing as companies redefine delivery logistics efficiency and shorten delivery times and efficiency. While the

non-consumable categories may continue to lead co9nsumable products in the sheer volume, gain in logistics efficiency have increased the use of ecommerce channels for acquiring goods, including FMCGs.

CHAPTER FOUR

DATA PRESENTATION, DISCUSSION AND ANALYSIS

4.1 Introduction

These chapter includes the summary of the various results of the data analysed as per the objectives set for the study. There are presentation and discussion of the key objectives and explanations to the various variables used for the study. There has also been made use of some scholarly works that were found in existing literature.

The data to this study was analysed in order to identify the trends that need to be identified, described or to be explored. The analyses for the study was strictly based on the responses that was given by the respondents of the sampled employees of the industries that were considered for the study. The analysis for the study was based on the responses from the selected employees of the of the selected organisations. It was based on five selected manufacturing industries within the Greater Accra Region.

4.2 Demographic Characteristics of Respondents

These section deals with the demographics of the respondents who were sampled to take part in the study. Some of the characteristics discussed include age, gender, marital status, education, and for how long they have worked in the various organisations under the study.

4.2.1 Age

Regarding the age distribution of the participants, the questionnaire elicited information from respondents in the following age brackets. The ages ranged between 18 years to 24 years, 25 to 31 years, 32 to 38years, 39 to 45 years and 46 years and above. Analysis from the study indicates that 1.5 percent of the respondents representing 4 respondents the youngest age category of 18 years to 24 years. This category was followed by those in the age bracket between the age 46 years and above recorded a 2.2 percent of the respondents which translates into 6 respondents. The next category is the age between 25

to 31 years of age which recorded a respondent of 47 which translates into 17.5 percent of the questionnaire administered. The next category are those in the age bracket 39 to 45 years who recorded a frequency of 95 which translates into 35.3 percent of the total number of respondents. The highest group of the respondents fall between the age bracket of 32 to 38 years. They recorded a respondent rate of 117 and a percentage of 43.5. Interpretation of the data on age distribution of the respondent demonstrates that the those in the age bracket between 32 to 45 years formed majority of the respondents recording at total of 78.8 percent of the total respondents.

Table 4.1: Age Distribution of Respondents

Respondents Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-24	4	1.5	1.5	1.5
	25-31	47	17.5	17.5	19.0
	32-38	117	43.5	43.5	62.5
	39-45	95	35.3	35.3	97.8
	46 and above	6	2.2	2.2	100.0
	Total	269	100.0	100.0	

Source: Field Data, 2022

4.2.2 Gender of Respondents

The table below demonstrates the gender of the respondents. Out of a total of 269 respondents, a majority of 238 of the respondents representing 88.5 percent of the respondents are males. Female respondents for the study recorded a respondent's rate of 31 which represents 11.5 percent of the respondents. the gender representation shows that there are more male than female respondents.

Figure 4.2: Gender Distribution of Respondents

Respondents Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	238	88.5	88.5	88.5
	Female	31	11.5	11.5	100.0
	Total	269	100.0	100.0	

Source: Field Data, 2022.

4.2.3 Marital Status of Respondents

Regarding the marital status of the respondents, the data demonstrates that 5 respondents are Divorced, which represents 1.9 percent of the respondents. There are 212 respondents who are Single representing the highest category of 78.8 percent of the respondents. there are also 52 respondents who are Married and who have a representation of 19.3 respondents.

Table 4.3: Marital Status of Respondents

Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Married	52	19.3	19.3	19.3
	Single	212	78.8	78.8	98.1
	Divorced	5	1.9	1.9	100.0
	Total	269	100.0	100.0	

Source: Field Data, 2022.

4.2.4 How long respondents have been working in their organisations

Assessing the number of years' respondents have been working in their organisations, the analysis of the data suggests that 3 of the respondents (1.1 percent) have been working in the organisation less than 1 year. There are others who have been working in the organisation between 1to 3 years. They recorded

a respondent's rate of 23 which represents 8.6 percent of the respondents. other employees who have been working in these organisations between 4 to 6 years have the highest responds rate. They represent 55.8 percent of the responds and a frequency of 155 of the respondents. 32.7 percent of the respondents have been working in the organisation between 7 to 9 years and only 1.9 percent of the respondents have been working in their organisations for 10 years and above.

Table 4.4: Number of years' respondents have been working

How long have you been working in this organisation

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	3	1.1	1.1	1.1
	1-3	23	8.6	8.6	9.7
	4-6	150	55.8	55.8	65.4
	7-9	88	32.7	32.7	98.1
	10 years and above	5	1.9	1.9	100.0
	Total	269	100.0	100.0	

Source: Field Data, 2022.

4.2.5. Respondents place of work

Assessing which of the industries is the respondent an employee, the data demonstrates that 20.8 percent of the respondents work at Kasapreko Company Limited, 22.7 percent of the respondents work at GHACEM Ghana Limited, 20.4 percent of the respondents work with Fan Milk Ghana Limited. Also 16 percent of the respondents are respondents from Unilever Ghana Limited and 20.1 percent of the respondents are employees of Guinness Ghana Limited.

Table 4.5: Respondents place of Work

Which of these industries do you work in

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Kasapreko	56	20.8	20.8	20.8
	GHACEM	61	22.7	22.7	43.5
	Fan Milk	55	20.4	20.4	63.9
	Unilever	43	16.0	16.0	79.9
	Guinness	54	20.1	20.1	100.0
	Total	269	100.0	100.0	

Source: Field Data, 2022.

4.2.6. Respondents Academic Qualification

In assessing the level of education of the respondents, the data collected demonstrates that 5 respondents representing 1.9 percent are employees with Basic Education and Senior High School qualifications. 21 respondents which represents 7.8 percent of the respondents have the qualification of Higher National Diploma (HND) and its equivalent. 126 respondents which represents 46.8 percent of the respondents and the highest responds rate have a qualification of Bachelors or 1st Degrees. The data also demonstrates that 117 of the respondents which represents 43.5 percent of the respondents have Masters or 2nd Degrees.

Table 4.6: Respondents level of Education

What is your level of education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	HND/ Equivalent	21	7.8	7.8	7.8
	1st Degree	126	46.8	46.8	54.6
	2nd Degree	117	43.5	43.5	98.1
	5	5	1.9	1.9	100.0
	Total	269	100.0	100.0	

Source: Field Data, 2022.

4.3 Summary Statistics for Variable Items

Respondents were made to tick answers from a list of ratings. The list of items were ranked in a five option ratings: strongly Disagree (1), Disagree (2), Uncertain (3), Agree (4) and Strongly Agree (5). Summary statistics for the responses have been computed in mean (M), standard (SD) values and in percentages (%). Items with Standard Deviation score that are lower than the mean scores are considered to have to a larger extent in disagreement with the item. The in Communication Technology, Application Software, Application Procurement Policy, Technical Support Staff and Procurement Performance have been examined in the foregoing table.

Table 4.7: Summary of mean, Standard Deviation and Percentage Variable Items

Item Statistics

No.	Variables	Mean	Std. Deviation	Percentages
	Communication Technology			
CT1	Every employee involved in the procurement process has company email address	4.7249	.55194	94.498
CT2	Email is used in sending and receiving quotations	4.7584	.50109	95.168
CT3	Emails improve tracking of transactions	4.7732	.46987	95.464
CT4	Suppliers use telephone to quickly and directly get answers to their queries	4.7695	.47202	95.39
CT5	Devises are used to complete procurement tasks from any location	4.7435	.48600	94.87

CT6	Notification for procurement approval and rejection are received and sent instantly via mobile devises	4.7361	.52639	94.722
CT7	Video conferencing is used to conduct procurement meetings with stakeholders online	4.7063	.61023	94.126
CT8	Video conferencing has reduced travelling cost	4.7063	.61023	94.126
CT9	Video conferencing has speeded up decision making in procurement	4.7063	.59161	94.126
	Application Software			
AS1	Processing tenders using e- procurement software has increased transparency	4.7546	.53882	95.092
AS2	E- procurement software has improved information sharing with our suppliers	4.7361	.58673	94.722
AS3	the use of e-procurement system has reduced transaction time	4.7286	.58968	94.572
AS4	The use of Enterprise Resource Planning Software solutions has increased process integration in our organisation	4.7584	.53704	95.168
AS5	Use of ERP system has led to improved decision making since information on the procurement is readility available	4.7695	.51001	95.39
AS6	By using the ERP purchase orders are created electronically thus reducing cost	4.7546	.51037	95.092
AS7	Spend analysis system has resulted in the elimination of non performing suppliers	4.7546	.50300	95.092
AS8	The use of contract management software has improved reporting and compliance	4.7509	.58051	95.818
AS9	Contract management software has reduced the time taken to prepare contract in procurement	4.7100	.61506	94.2
AS10	I am confident to say that application software have increased the procurement performance of my organisation	4.7361	.59932	94.722
AS11	I am confident to say that electronic software have reduced cost of procuring goods and services in my organisation	4.7286	.62051	94.572
	Electronic Procurement Policy			
EPP1	We have an online security password that requires username and password to be sent to users via email enhancing confidentiality	4.7361	.55402	94.722
EPP2	Our online security policy guides that users should be advised to immediately change their passwords on receipt	4.7175	.59390	94.35
EPP3	Our online security policy governs password design thus enhancing the strength of the password	4.7435	.59632	94.87
EPP4	We have an online security policy on user access security controls	4.7621	.58836	95.242
EPP5	We have an electronic invoicing policy that covers the content of the invoice	4.8773	2.53406	97.546
EPP6	Our electronic invoicing policy covers the means of demonstrating that the invoice is authentic	4.7175	.64798	94.35
EPP7	We have an electronic tendering policy that covers and ensures that the tender contents are valid	4.8959	3.00813	97.918
EPP8	Our electronic tendering policy allows for extension of tender closing/ opening period	4.7175	.62452	94.35
EPP9	The electronic record policy covers when and how to destroy the records	4.7398	.59156	94.796
EPP10	We have an electronic records management policy that defines how electronic records generated and stored	4.7546	.56584	95.092
	Technical Support Staff			
TSS1	Our technical support staff have the necessary knowledge to deliver products and services that support procurement	4.7361	.59932	94.722

TSS2	Our technical support staff are able to effectively cordinate their work responds to electronic procurement incidences	4.7584	.57072	95.168
TSS3	The technical support staff are able to analyze problems in electronic systerms and provides solutions	4.7621	.55575	95.242
TSS4	The technical support staff are able to communicate and understand the needs of our procurement users	4.7546	.58529	95.092
TSS5	Our organisation has an adequate number of electronic procurement technical support staff	4.7695	.51001	95.39
TSS6	Our technical support staff respond promptly when we have ICT related technicalities	4.7658	.48961	95.316
TSS7	Our procurement technical support staff only supports procurement users	4.7509	.52658	95.018
TSS8	Manual procurement procedures have been stopped for ICT use	4.7621	.49915	95.242
TSS9	Our support staff are trained regularly	4.7509	.51221	95.018
TSS10	There are e-learning tools for ICT training	4.7398	.53874	94.796
TSS11	Support staff check and maintain control to ensure confidentiality	4.7621	.54215	95.242
	Procurement Performance			
PP1	There is reduced lead time as a result of ICT	4.6877	.57876	93.754
PP2	There has been increased transparency and performance in procurement	4.7026	.56054	94.052
PP3	ICT has increased supplier performance in my organisation	4.6394	.56655	92.788
PP4	Contract performance in my organisation has greatly improved	4.6580	.54818	93.16
PP5	The profitability of my organisation has greatly increased as a result of the incorporation of ICT	4.6245	.55677	92.49
PP6	I can boldly state that the improved procurement performance in my organisation is as a result of the introduction of ICT	4.6506	.56368	93.012
PP7	My organisation is able to deliver better in procurement than we use to	4.6097	.60475	92.194

Source: Field Data, 2022.

Testing the reliability of Communication Technology, nine items were tested. All the nine items on the scale recorded strong positive relationship. the results indicate that email usage in sending and receiving quotations, tracking of transactions and supplier use of telephone to quickly and directly get answers to their queries scored 95.168, 94.464 and 95.39 respectively, forming the highest scores in terms of percentages. This means that organisations have increased the use of communication technology. The responses recorded the highest Mean and percentages showing the values that the respondents placed on the metrics measured. Other metrics measured include video conferencing is used to conduct procurement meetings with stakeholders online (CT7), video conferencing has reduced travelling cost (CT8) and video conferencing has speeded up decision making in procurement (CT9). These variables recorded a mean of 4.7063, 4.7063 and 4.7063 and a corresponding percentage of 94.126, 94.126 and 94.126 respectively. These variables recorded positive relationship with procurement performance and

the promotion of ICT. The realisation of a Cronbach Alpha value of 0.926 shows a strong reliability of the values and a positive relationship between the values.

Regarding the use of Application Software, it was observed from the data that all the variables used for the test recorded a mean score of above 4.7. This recorded a percentage term of 94 percent and above. Showing that the variables show a strong positivity. Variables such as processing tenders using e-procurement software has increased transparency (AS1), the use of enterprise resource planning (AS4), the use of ERP leading to improved decision making (AS5), ERP purchase orders are done electronically to reduce cost (AS6), Spend analysis has resulted in the elimination of non-performing suppliers (AS7) and the use of contract Management software has improved reporting and compliance (AS8) have all recoded more than 95 percent showing strong positivity. These shows that the respondents were more conversant with the above mentioned variables as having significant positivity and driver of ICT as independent variable and procurement performance. To determine the internal consistency of the items used for the reliability, the Cronbach Alpha value for Application Software is 0.932. This means that there is strong internal consistencies with the items used.

With regards to Electronic Procurement Policy, ten items were used in measuring the variable. These variable tested the availability of Electronic Procurement Policy. The variables recorded very high mean variables of above 4.7 which has resulted in each item recording more than 94 percent showing very strong and strong positivity and relationship. items such as, we have an online security policy on user access security control (EPP4), having electronic invoicing policy that covers the content of the invoice (EPP5), we have an electronic tendering policy that covers and ensures that the tender contents are valid (EPP7) and having an electronic records management policy that defines how electronic records generated are stored (EPP10), recorded 95.242, 97.546, 97.918 and 95.092 respectively scores the highest on the scale showing a very strong positivity. The overall interpretation of the result here indicates that the respondents have attached very high importance to electronic procurement policy as

all the items under the variable recorded very high percentages. A Cronbach Alpha value was determined to ascertain the internal consistency of the items used for the analysis. The Cronbach Alpha value achieved for Electronic Procurement Policies is 0.506. This means that although positive, the is very weak.

The items measuring Technical Support Staff contains eleven different questions. Regarding these, all the items under Technical Support Staff recorded a mean of more than 4.7 which translate into a more than 94 percent score. Items such as: Our technical support personnel can efficiently organize their activities in response to incidents involving electronic procurement (TSS2), The technical support team can identify issues with electronic systems and offer fixes (TSS3), The technical support team can interact with and comprehend our procurement users' demands (TSS4), Our company has a sufficient quantity of technical support workers for electronic buying (TSS5), When we encounter ICT-related issues, our technical support personnel reacts quickly (TSS6), For ICT usage (TSS8) recorded 95.168, 95.242, 95.092, 95.39, 95.316, and 95.242 accordingly, manual procurement procedures have been discontinued. They recorded the strongest positivity towards the integration of ICT and how that impacts the procurement performance of organisations. The Cronbach Alpha value determined or achieve or Technical Support staff is 0.926. This means a very high internal consistencies achieved for reliability.

With regard to Procurement Performance as the dependent variable, seven items were used to measure the reliability. The result show that, the item there has been increased transparency and performance in procurement (PP2) recorded the highest mean value of 4.7026 and a standard deviation of .56054. it recorded a percentage of 94.052. this demonstrate that respondents have place higher importance on increase transparency and performance of in procurement as against the rest of the items considered. The item that recorded the lowest is organisation is able to deliver better in procurement than we use to. It recorded a mean of 4.6097, a standard deviation value of .60475 and a percentage of 92.194. although it recorded a value above 90 percent its positive relationship is lower than the rest. It is safe to conclude

that increased transparency has achieved higher success as against the organisation being able to deliver better procurement than we use to.

4.4 Analysis of Research Objectives

The sections below are the final parts of the analysis as it is concentrated on testing that was done on the objectives set for the research. A series of regression analysis was done to determine the effects that each variable has on the as stated in the objectives set for the study.

4.4.1 Effects of Communication Technology on Procurement Performance among Manufacturing Industries in Ghana

The aim was set specifically to assess the impact of communication technology on procurement performance, and it was found that there is a positive link between communication technology and procurement performance. Regression analysis was used to investigate the connection between the investigated variables. These involved the use of linear regression model in which communication technology (Independent variable) was regressed on procurement performance as the dependent variable. The regression as conducted yielded a general linear regression functional model of **PP= b0+b1 (CT) +E.** where PP is Procurement Performance, b0 and b1 are the coefficients, CT is Communication Technology and E is the Error. The figures realised for this estimation has been summarised in the following table:

Table 4.8: The effect of Communication Technology on Procurement Performance

Estimated Variables	*Coefficient*	*Standard Error*	*t-stat*	*Significant*
Dependent	4.419	0.329	13.443	0.000
Communication Technology	0.049	0.069	0.715	0.475
F stat			0.511	
R			0.044	
R Square			0.002	
Adjusted R Square			-0.00	

Source: Field Data, 2022.

An evaluation of the linear regression as demonstrated above records a dependent variable value of 4.419. It recorded a coefficient value of the independent variable being Communication Technology of 0.049. These resulted in a linear equation between the variables to mean **PP=4.419+0.049 (CT).** These results in a positive linear relationship between Communication Technology being the independent variable and the dependent variable being Procurement Performance. These means that communication technology has a positive relationship with the procurement performance of manufacturing industries in Ghana. Invariably, an increase in communication technology would see a corresponding increase in procurement performance. Also, a decrease in the independent variable would also see a decrease in the performance of the dependent variable. The overall regression is significant and also recorded the following scores: f statistics of 0.511, R value of 0.044, R Square of 0.002, and Adjusted R Square value of 0.00. These findings from the data is consistent with some of the findings by some authors such as Vukal (2008), Calipinar et al (2012) and Sirilak et al (2004), that communication technology has an influence on procurement performance.

4.4.2 Effects of Application Software on Procurement Performance functions in the Manufacturing Industry in Ghana.

A second objective of the study is to test the effects of application software on procurement performance functions in the manufacturing industry in Ghana. Application software was proposed to have a favorable link with procurement performance in literature. Application software, which is an independent variable, and Procurement Performance, which is a dependent variable, were both subjected to a regression analysis to examine their connection. A regression analysis was conducted on the objective which realised the equation **PP= b0+b1 (AS) + E,** where PP is Procurement Performance, b0 and b1 are the coefficients, AS being Application Software and E represents Errors. A summarised analysis of the results and their coefficients are demonstrated in figure 4.8 below.

Table 4.9: The effect of Application Software on Procurement Performance

Estimated Variables	*Coefficient*	*Standard Error*	*t-stat*	*Significant*
Dependent	3.632	0.317	11.473	0.000
Application Software	0.215	0.066	3.237	0.001
F stat			10.481	
R			0.194	
R Square			0.038	
Adjusted R Square			0.034	

Source: Field Data, 2022.

In analysing the results of from the regression results in figure 4.8 above, the dependent variable or the intercept recorded a coefficient value of 3.632 and an independent value or Application Software value of 0.215. The values resulted in a linear equation of the regression values as **PP= 3.632+0.215(AP)** resulting in a positive outcome. These means that there is positive relationship between Application Software and Procurement Performance in the manufacturing industry in Ghana. Invariably, what this means is that when there is an increase in Application Software usage in the manufacturing sector, there is a corresponding increase in Procurement Performance in the manufacturing industries in Ghana. Also, where there is as decrease in Application Software would see a corresponding decrease in the Procurement Performance of the manufacturing sector. The overall score of the regression is significant and also recorded the following scores: f statistics of 10.481, R of 0.194, R Square of 0.038 and an Adjusted R Square of 0.034 pointing to a positive relationship. The positive relationship between Application Software and Procurement Performance is consistent with the findings in literature review of some researchers such as Nicholas et al (2018), Monczka, Handfield, Giunipero, & Patterson (2015) and Mohammed et al (2012) among others. The finding from this study corroborates the findings of these researchers that there exists a positive relationship between Application Software and Procurement Performance.

4.4.3 Effects Electronic Procurement Policy on Procurement Performance in the Manufacturing Industry in Ghana.

Third objective for the study to ascertain the effects that Electronic Procurement Policy has on Procurement Performance in the manufacturing industry in Ghana. The objective was invariable set to predict the relationship that exists between the two variables. To be able to test the relationship, a regression analysis was conducted to Electronic Procurement Policy as an independent as against Procurement Performance which is a dependent variable. The regression analysis conducted yielded a linear regression equation of **PP=b0+b1 (EPP)+ E,** where PP is Procurement Performance (Dependent variable), b0 and b1 are the coefficients of the regression, EPP being Electronic Procurement Policy and E representing the standard of Error value. The regression analysis run has been summarised and the coefficients demonstrated in the figure 4.9 below.

Table 4.10: The effect of Electronic Procurement Policy on Procurement Performance

Estimated Variables	*Coefficient*	*Standard Error*	*t-stat*	*Significant*
Dependent	3.378	0.231	14.601	0.000
Electronic Procurement Policy	0.267	0.048	5.550	0.000
F stat			30.801	
R			0.322	
R Square			0.103	
Adjusted R Square			0.100	

Source: Field Data, 2022.

To analyse the regression figures in figure 4.9 above, the dependent variable or Procurement Performance recorded a coefficient figure of 3.378 and Electronic Procurement Policy which is the independent variables recorded 0.267. The results from regression analysis results a linear regression is **PP= 3.378+ 0.267 (EPP)** which produces a positive outcome. Although not very strong, it has a positive relationship with Procurement Performance. The result demonstrates that an increase in Electronic Procurement Policy would somewhat increase Procurement Performance. Invariably, a decrease in the

Electronic Procurement Policy would have a corresponding decrease in the Procurement Performance among manufacturing industries in Ghana. As a result, managers of industries are expected to increase investment in Electronic Procurement Policy to achieve procurement Performance. The overall performance of the scores from the regression is significant to the study. The regression recorded the following scores: f statistics of 30.801, R of 0.322, R Square of 0.103 and an Adjusted R Square of 0.100 pointing to a positive relationship between the two variables under consideration. These confirms the assertions made by some researchers such as Jangra et al (2020), Talluri (2008) and Gibbs, Kraemer & Dedrick (2006) that Electronic Procurement Policy has a significant impact or effect on Procurement Performance.

4.4.4 Effect of ICT Technical Support Staff on the Procurement Performance in the Manufacturing Industry in Ghana

The Fourth objective of the study is to ascertain the effects of ICT Technical Support Staff on the Procurement Performance in the manufacturing industry in Ghana. A regression analysis was conducted to ascertain the relationship and impact of ICT Technical Support Staff on Procurement Performance. The relationship between the two variables recorded a linear regression equation of **PP= b0+b1 (TSS) + E,** b0 and b1 represents the coefficients of the regression b1 represents the dependent variable or Procurement Performance, b0 represents the Independent variables or Technical Support Staff and E representing the standard of error. The regression figures have been summarised and the coefficients stated in figure 4.10 below.

Table 4.10: The effect of Technical Support Staff on Procurement Performance

Estimated Variables	*Coefficient*	*Standard Error*	*t-stat*	*Significant*
Dependent	3.378	0.231	14.601	0.000
Technical Support Staff	0.267	0.048	5.550	0.000
F stat			30.801	
R			0.322	
R Square			0.103	

Adjusted R Square			0.100	

Source: Field Data, 2022.

In analysing the regression analysis above, it is important to state the regression values. The coefficient values of the dependent variable is 3.378 and the coefficient values of the independent value or Technical Support Staff is 0.267. The regression analysis posited a linear regression equation of **PP=3.378+0.267 (TSS),** resulting in a positive relationship between the variables. The result demonstrates an appreciable positive relationship between the variables. What this means is that, Technical Support Staff has a positive relationship with Procurement Performance. What this means is that anytime there is an increase in the quality of Technical Support Staff of a manufacturing industry there is a corresponding increase in the Procurement Performance of the organisation. Invariably, when there is a decrease in the quality of the Technical Support Staff of a manufacturing industry would lead to a decrease in Procurement Performance of the manufacturing company. Therefore, if managers of manufacturing industries want and increase in Procurement Performance, they must increase the quality of Technical Support Staff. The regression recorded the following scores: f statistics of 87.345, R of 0.496, R Square of 0.246 and an Adjusted R Square of 0.244 pointing to a positive relationship between the two variables under consideration. These conclusion corroborates the assertions by many researchers such as Vadim (2007), Shih et al (2011), Wagner & Ettrich-Schmitt (2009) and Barua et al (2004) that quality Technical Support Staff has a positive relationship with Procurement Performance.

4.5 Conclusion

The chapter analysed data collected from respondents from the five manufacturing industries under the study. The analysis was done taking into consideration the frequencies of the demographic values of the various respondents. It also considered the regression analysis, reliability and the determination of the Cronbach Alpha of the data collected. The result from the analysis demonstrates a positive relationship between the independent variables of ICT such as Communication Technology, Application Software,

Electronic Procurement Policy and Technical Support Staff on the one hand and their corresponding effects on Procurement Performance in the manufacturing industries in Ghana.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter five of the study is the concluding chapter. This chapter concludes the study in three parts. The first part deals with a summary of the results and the findings that have been realised from the analysis conducted including the various inferences that are realised from the study and analysis conducted. The second part deals with the conclusions from the analysis and the study and the third part deals with the recommendations that are intending to deal with the issues and the problems realised from the study.

5.2 Summary of major findings

The study set out to assess the impact of ICT on Procurement Performance in selected FMCG manufacturing firms in Ghana. The study selected five major manufacturing firms within the Greater Accra Region. The study administered 340 questionnaires and was able to retrieve a total of 269 from the respondents. the respondents were drawn from the five manufacturing industries selected and the respondents from among junior, senior and management members of the selected organisation. The questionnaire has a fair representation in terms of age, gender, educational background, as well as the number of years they have worked in those organisations. Majority of the employees have been working in their respective organisations for the between 4 to 9 years. Their representation as respondents is important as they have worked for many years in the organisation. The responses from the respondents have been subjected to the various statistical analysis and have resulted in the following findings which addresses the objectives set for the study.

5.2.1 Communication Technology

Results of the regression, reliability, and Cronbach Alpha tests on the goal of determining how well communication technology affects procurement performance. In order to determine the link, 9 things were evaluated. The majority of respondents claimed that communication technology had an impact on the effectiveness of procurement. The results show a favorable correlation between communications technology and successful procurement. What this demonstrates is that for managers of organisations to achieve higher procurement performance in the manufacturing sector, there must be a corresponding increase in the communication technology tools. The reason is that increase in communication technology tools such as the use of emails, telephony and video conferences has a major influence on the procurement processes and level of speed and accuracy which increases the procurement performance of an organisation. The overall effect is that procurement performance of manufacturing organisations in Ghana in greatly influenced by the use of communication technology.

5.2.2 Application Software

The objective sought to ascertain the effects of Application Software on procurement performance among manufacturing industries in Ghana. Findings from the study corroborates the assumption that application software have a positive relationship with procurement performance in the manufacturing industry in Ghana. In all, 11 items were tested with various statistical analysis. The descriptive analysis demonstrates that the most commonly used application software are Enterprise Resource Planning, Spend Analysis System and Contract Management Software. Majority of the respondents indicates that the use of application software is effective and have improved information sharing in the procurement processes in the manufacturing industry. Respondents also agreed that the use of ERP has significantly increased decision making ability of the organisations.

The results conducted on this variable indicated that there is a somewhat significant linear relationship between application software and procurement performance. This finding means that when more and

more improved application software is increased for an organisations use, the procurement performance of the organisation would also be automatically increased. Increase in procurement performance of an organisation is expected to also increase the overall performance of the organisation.

5.2.3 Electronic Procurement Policy

The aim of this study is to determine the effects of Electronic Procurement Policy on Procurement Performance. The purpose is to test the general hypothesis that Electronic Procurement Policy has a positive relationship with Procurement Performance. Ten elements were evaluated to predict the relationship in order to determine the relationship. A large number of respondents mentioned the existence of an electronic procurement policy. The majority of respondents claimed that the manufacturing sector's procurement performance has improved as a result of policies governing online security, electronic tendering, records management, and records storage.

The study's findings suggest that the association between electronic procurement policy and procurement performance is significantly linear. The findings on Electronic Procurement Policy and Procurement Performance lead to the conclusion that improving Electronic Procurement Policy has a favorable correlation with improving procurement performance in manufacturing industries.

5.2.4 ICT Technical Support Staff

This objective sought to underscore the effects of ICT Technical Support Staff on the Procurement Performance in the manufacturing industry in Ghana and to test the general position that ICT Technical Support Staff has a significant effect on the Procurement Performance of manufacturing industries. To test this variable, 11 items were tested to ascertain that fact. The descriptive analysis conducted on regression, Cronbach Alpha and reliability demonstrates a positive relationship between the two variables. Majority of the respondents demonstrated in the analysis that technical support staff has the requisite knowledge to man their department. There is the use of ICT tools in the procurement processes,

and are able to analyse problems in electronic systems and provide solutions have had significant impact on the ability of the industries to deliver quality procurement performance. The result of the findings on ICT Technical Support Staff is that there is a positive relationship with Procurement Performance in manufacturing industries.

5.3 Conclusions

The findings on the study conducted can simply be concluded that there is a significant or positive relationship between Information and Communication Technology and Procurement Performance among the manufacturing industries in Ghana. These confirms the findings of other researchers such as Hallyburton (2013), Wong et al (2011) and Stock, Boyer and Harmon, (2010) that there is a positive relationship between Information and Communication Technology on Procurement Performance. Wong et al (2011) concluded that the incorporation of ICT in the procurement processes of organisations have increased the level of transparency in procurement processes and reduced the lead time of organisations.

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The findings of the study can further be concluded that the Communication Technology as it were plays a very important role in the improvement of the procurement function of manufacturing industries in Ghana. From the study, it is clear that the use of telephone, emails, video conferencing and the tracking of all procurement processes has greatly improved the level of communication and procurement performance of manufacturing companies.

Taking into consideration Application Software, the findings from the study suggest that the key application software that are used by the manufacturing companies in Ghana include Enterprise Resource Planning (ERP), Spend Analysis Systems (SAS), Contract Management Software (CMS). The use of the afore mentioned software has gone a long way to improve the procurement performance of the manufacturing industries as there is reduced lead time and the increased ability of the industries to

deliver and purchase goods and services for effective and efficient production. The findings suggest that the use of the Spend Analysis Systems software has helped organisations to detect the areas of spend and unnecessary costs and helps in their reduction.

The respondents understanding of the area of the use of Electronic Procurement Policy in an organisation has helped in increasing the level of accountability and security in the procurement performance and function in manufacturing industries in Ghana. It is found that industries try to put in place electronic procurement policies in order for them to ensure that there is security and reduced human interfaces that breeds corruption. The use of electronic invoicing policy, electronic tendering policy, electronic record policy has greatly impacted the manufacturing industries ability to increase their procurement performance. The use of electronic tendering system helps in the ability of the organisation to trace all tenders that have been submitted and their evaluation without any form of biases.

Findings from the study conducted suggests that ICT Technical Support Staff has a strong relationship with procurement performance in the manufacturing industry. People working as ICT Technical Support Staff require special and technical knowledge and skills to help them in the management of the ICT and procurement processes of the organisations. Findings suggest that they are able to communicate the technical issues to other employees and are able to promptly respond to problems that are ICT related in the organisation. as a result, an inference can be drawn from the fact that any manufacturing industry that sought to increase its procurement performance must as well be able to increase the training and capacity of its technical support staff.

5.4 Recommendations

The discussions from the study on findings and the conclusions discussed above suggests a number of recommendations for manufacturing industries as a whole and especially those chosen for this study.

Firstly, individuals employed by manufacturing industries to serve as ICT Technical Support Staff are expected to be given regular training by the organisation. For an organisation to have an effective and efficient electronic procurement and procurement performance, its technical staff must be in tune with the modern trends and the changes that are taking place in the Information and Communication Technology sub sector. Many of these trainings must take the form of online training, on the job training and the use of seminars and other forms as would be allowed by management of the organisation. this is important as staffs supporting technically has the greatest and most significant effect on the ability to achieve a robust procurement performance in the manufacturing industry.

Secondly, manufacturing organisation who want to achieve competitive advantage over other are expected to increase improvements in their electronic procurement policies in order to streamline organisations procurement management and processes. An effective electronic procurement policies are expected to guarantee responsibility and fairness in the procurement processes of organisation in order to achieve procurement performance of organisations. The design for electronic procurement policies must be in line with the strategic objectives of the organisation.

A third recommendation is that manufacturing industries must increase their ability to integrate more robust Communication Technology into their work processes as that reduces cost and increases overall profitability and the procurement performance of the organisation.

It is important that organisation that want to increase profitability and increased procurement performance must as well purchase and use robust and up to speed application software for their work processes. The application software is expected to reduce cost by eliminating unproductive suppliers and maverick buying in an organisation.

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APPENDIX 1

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
(DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT)
SURVEY QUESTIONNAIRE

Thank you for accepting to participate in this study which seeks to find out the impact of Information and Communication Technology on Procurement Performance in the Manufacturing Industry in Ghana. By the study, it sought to underscore the impacts that Information and Communication Technology have on the Procurement Performance among Manufacturing Industries in Ghana. All answers provided will be kept confidential and for research purposes only.

Please tick (√) your responses in the boxes provided appropriately.

PART 1: RESPONDENT'S DEMOGRAPHIC INFORMATION

1. Respondent's Age:

☐ 18 to 24 years ☐ 25 to 31 years ☐ 32 to 38 years

☐ 39 to 45 years ☐ 46 years and more

2. Respondent's Gender:

☐ Male ☐ Female

3. Marital Status:

Single ☐ Married ☐ Divorced ☐

4. How long have you been a working in this Industry?

☐ Less than 1 year ☐ 7 - 9 years
☐ 1 - 3 years ☐ 10 years and above
☐ 4 - 6 years

5. Which of these Industries do you work in? 1. Kasapreko 2. GHACEM 3. Fan Milk

4. Unilever Ghana Limited 5. Guinness Ghana Limited

6. What is your highest level of education?

☐ JHS/SHS ☐ 1st Degree

☐ HND/Equivalent ☐ 2nd Degree

Other, please specify……

SECTION A: RESPONDENT'S UNDERSTANDING OF THE IMPORTANCE OF COMMUNICATION TECHNOLOGY ON PROCUREMENT PERFORMANCE IN MANUFACTURING INDUSTRY IN GHANA.

Please, use the 5-point scale below to provide responses to the following items by ticking the appropriate box of your preference where **1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree and 5 = Strongly Agree.**

	1	2	3	4	5
Regarding the effects of Information and Communication Technology on Procurement Performance in the manufacturing industry……..					
Every employee involved in the procurement process has company email address					
Email is used in sending and receiving quotations					
Emails improve tracking of transactions					
Suppliers use telephone to quickly and directly get answers to their queries					
Devises are used to complete procurement tasks from any location					
Notifications for procurement approvals and rejection are received sent instantly via mobile devices					
Video conferencing is used to conduct procurement meetings with stakeholders online.					
Video conferencing has reduced travelling cost					
Video conferencing has speeded up decision making in the procurement					

SECTION B: Evaluate the effects of application software on procurement performance in the manufacturing industry in Ghana.

Please, use the 5-point scale below to provide responses to the following items by ticking the appropriate box of your preference where **1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree and 5 = Strongly Agree.**

	1	2	3	4	5
Regarding the effects of application software on procurement performance in the manufacturing industry in Ghana					
Processing tenders using the e-procurement software has increased transparency					
E-procurement software has improved information sharing with our suppliers					
The use of e- procurement system has reduced transaction time					
The use of Enterprise Resource Planning (ERP) software solutions has increased process integration in our organisation					
Use of the ERP system has led to improved decision making since information on procurement is readily available					
By using the ERP, purchase orders are created electronically thus reducing cost					
Spend analysis system has resulted in elimination of non-performing suppliers					
Use of the contract management software has improved reporting and compliance					
Contract management software has reduced the time taken to prepare contract in procurement					
I am confident to say that application software have increased the procurement performance of my organisation					
I am confident to say that electronic software have reduced cost of procuring goods and services in my organisation					

SECTION C: Ascertain the effects electronic procurement policy on procurement performance in the manufacturing industry in Ghana.

Please, use the 5-point scale below to provide responses to the following items by ticking the appropriate box of your preference where **1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree and 5 = Strongly Agree.**

	1	2	3	4	5
Regarding the effects of electronic procurement policy on procurement performance in the manufacturing industry in Ghana					
We have an online security policy that requires username & password to be sent to users via email enhancing confidentiality					
Our online security policy guides that users should be advised to immediately change their passwords on receipt					
Our online security policy governs password design thus enhancing the strength of the password					
We have an online security policy on user assess security controls					
We have an electronic invoicing policy that covers the content of the invoice					
Our electronic invoicing policy covers the means of demonstrating that the invoice is authentic					
We have an electronic tendering policy that covers and ensures that the tender contents are valid					
Our electronic tendering policy allows for extension of tender closing/opening period					
The electronic record policy covers when and how to destroy the records					
We have an electronic records management policy that defines how electronic records generated and stored					

SECTION D: Evaluate the effect of ICT technical support staff on the procurement performance in the manufacturing industry in Ghana.

Please, use the 5-point scale below to provide responses to the following items by ticking the appropriate box of your preference where **1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree and 5 = Strongly Agree.**

	1	2	3	4	5
Regarding the effects of ICT technical staff on the procurement performance in the manufacturing industry in Ghana……..					
Our technical support staff have the necessary technical knowledge to deliver products & services that support procurement					

Our technical support staff are able to effectively coordinate their work and respond to electronic procurement incidences					
The technical support staff are able to analyze problems in electronic systems and provide solutions					
The technical support staff are able to communicate, understand the needs of our procurement Users					
Our organization has an adequate number of Electronic procurement technical support staff					
Our technical support staff respond promptly when we have ICT related technicalities					
Our procurement technical support staff only support procurement Users					
Manual procurement procedures have been stopped for ICT use					
Our support staff are trained regularly					
There are e-learning tools for ICT training					
Support staff check and maintain control to ensure confidentiality					

SECTION E: EVALUATION OF RESPONDENTS UNDERSTANDING OF THE PRESENCE OF PROCUREMENT PERFORMANCE

Please, use the 5-point scale below to provide responses to the following items by ticking the appropriate box of your preference where **1 = Strongly Disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree and 5 = Strongly Agree.**

	1	2	3	4	5
Regarding respondent understanding of the presence of procurement performance in the organisation					
There is reduced lead time as a result of ICT					
There has been increased transparency and performance in procurement					
ICT has increased supplier performance in my organization					
Contract performance in my organization has greatly improved					
The profitability of my organisation has greatly increased as a result of the incorporation of ICT					
I can boldly state that the improved procurement performance in my organisation is as a result of the introduction of ICT					
My organisation is able to deliver better in procurement than we use to					

Thank you for your participation!