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KUMASI, GHANA**

**EXPLORING THE ADOPTION OF E-PROCUREMENT IN THE PUBLIC  
SECTOR AS A TOOL FOR COST SAVING: A CASE STUDY OF TEN (10)  
PUBLIC SERVICE MINISTRIES IN GHANA.**

By

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A Thesis submitted to the Department of Construction Technology and Management,  
College of Art Built Environment  
in partial fulfilment of the requirement for the degree of

**MASTER OF SCIENCE**

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**DECLARATION**

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

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## **DEDICATION**

This dissertation is dedicated to my family especially my lovely wife and daughter for the unwavering support.

## **ACKNOWLEDGEMENT**

My profound gratitude to the Almighty God for His mercies and grace throughout the Postgraduate study.

I am very grateful to my supervisor Dr. Gabriel Nani who guided me in my research and his support throughout my postgraduate study. I really appreciate his comments, constructive criticisms, and his patience that has helped me to complete this research.

I am also thankful to my family and colleagues for the encouragements during my Postgraduate study. I say thank you and God bless you.

## **ABSTRACT**

E-procurement is one of the largest drivers of change in any industry. The aim of this study is to explore the adoption of e-procurement in the Public Sector as a tool for cost saving. To accomplish this objective, the study reviewed some theoretical works on the role of e-procurement as a tool for cost saving, cost saving methods and e-procurement options to enhance cost saving.

The study adopted a purposive sampling technique to collect data from ten public sector ministries using questionnaire survey approach. The responses were analysed using descriptive statistics, Relative Importance Index (RII), and mean score ranking.

The results revealed that task improvements, network connectivity/integration and supplier participation are the main cost saving methods that can be enhanced by e-procurement. The study identified e-procurement options such as sharing real time information, time management, and automation of creating requisitions to optimize cost savings in the public sector. The study concluded that e-procurement is a cost saving method and practitioners especially procurement officers should put into practice this knowledge as it aids in efficient savings when it comes to procurement.

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 BACKGROUND**

In developing countries, public procurement often constitutes the largest domestic market. The public procurement system has a contributing factor to the economic development of a country depending on how it is managed (Migai, 2005). The procurement process however is faced with a long chain of stages as it stretches from the planning to the reporting stages of work. The principles of value for money and sustainability must become the core goal on which procurement is undertaken due to the cost implications of various stages of the procurement process (Mamiro, 2016).

The past decade has seen the internet not only serving as the grounds for scientific networking but also creating the platform for an uprising of business (Jeyaraj et al., 2006). Currently, it has been seen that the internet step into business has change the way business transaction is done is every industry. Information on goods, works and services has become easy with the help of World Wide Web. This has led to e-procurement being the most talked about topic as far as procurement is concern. Ranking et al., 2006 suggested that without doubt, in the near future, the means of purchasing will also change. Currently in both developed and developing countries, governments has shown keen interest in ICT to improve the rate at which work is done with a concern of quality especially in the assessment of information. As a result of this, there is now more participation of the public in the tendering process as opportunities are easily and readily made known to them.

The process of obtaining goods or services at relatively cheaper cost to the satisfaction of the client in terms of quality, quantity, time and location is termed as procurement. Over the past decades, procurement has developed significantly.

Initially the concept of procurement was only limited to an administrative function until a prompt made by Porter (2006) in his five forces models made firms to view procurement as a strategic function other than the usual administration work as it showed that the supplier and the buyer are the two significant forces to reckon with in competition (Ngeno and Kinoti, 2017). The use of internet technology which align the business processes to improve productivity and efficiency is defined as e-procurement by Maffatto and Payaro (2004). Peleg et al., (2002) stated that e-procurement is able to integrate all the supply chain for efficient and effective productivity. Also, (Rajkumar 2001) stated that e-procurement is employed to align numerous supplier catalogue into a single view of the catalogue. This system will help the personnel buying to assess the profile of the product to be purchased and also make it easy for negotiations with suppliers.

Also, e-procurement computerizes most of the processes of purchasing (Kheng and Al-Hawamdeh 2002). According to Bendoly and Schoenherr (2005) e-procurement facilitates transaction costs reduction, quickens procurement, broadens supplier base, aligns procurement processes, better control over procurement spending and employee compliance, broadens supplier and buyer base, reduces paperwork, duplication of tasks and integrates procurement processes (Sarpong et al., 2017). The implementation of the public e-procurement technology has been recognized as a major tool for making changes in the process of public procurement. According to Thai 2001, the governments' major concern is on public procurement and argued again that reforms to the public procurement is of a great interest to the government agencies, policy makers and professionals of public procurement (Neupane et al., 2014).

The last two decades has shown the aggressiveness of African countries on the changes of management in public finance notably in the procurement system. The reformation has created the legal and comprehensive administrative framework in the procurement system. The establishment of institutions like the Public Procurement Authority (PPA) and the Appeals and Complaints Panel was geared towards the improvement of the performance of procurement (Honkaniemi, 2010). The public procurement law states that the process of procurement must allow for competition on a fair basis among suppliers, contractors and consultants (Dza et al., 2013). In Ghana, the public-sector procurement is regulated under the Public Procurement Act, 2003 (Act 663) as amended by Act, 2016 (Act 914). In defining public procurement, Ghana's PPA, (Acts 663) as amended defines it as the purchase of goods, works and services with utmost good faith, in the right quality and quantity and delivered at the expected time and location. This implies that the use of public funds to purchase goods and services is referred to as public procurement. Public procurement is a process that takes into account appropriate planning for procuring to the stage of reporting (Sarpong et al., 2017).

## **1.2 PROBLEM STATEMENT**

According to Connolly and Olson, 2000, e-procurement is the one of the largest drivers of change in any industry. In as much as e-business technologies has a significant impact on the output of a firm, however the desire to accept this technology is influenced by several factors of which the reduction of transaction costs is considered. In a study made by Owusu (2014) to assess the readiness of the procurement entities in Ghana revealed that there are some challenges that impede the smooth implementation of the e-procurement. End-user uptake and training, supplier adoption, inadequate e-procurement implementation strategy, costly technical solutions and lack of management support are but few of the identified

challenges that entities face in the implementation process (Asare and Prempeh, 2017).

According to UNEP (2012), the government is able to leverage the spending on public expenditure between 15 to 25% of its GDP when sustainable public procurement is practiced in order to promote the country's policies. There have been several reformations done in the procurement process in Ghana with the objective of eliminating corruption so that clients or the users can realize value for money. A major reformation occurred when the Procurement Act, Act, 663, in 2003 was passed. This law is believed to have to some extent ensured some sanity in the procurement system. Unfortunately, procurement as being practiced in the country is totally manual and has caused practitioners to demand for public sector e-procurement policy to be implemented and practiced in the country (PPA Module, 2007). It is behind this backdrop that this study goes into assessing the adoption of e-procurement in the public sector as a tool for cost saving in Ghana.

### **1.3 RESEARCH QUESTIONS**

Based on the research objectives outlined in the next page, the following research questions were asked:

1. What role does e-procurement play in cost saving in the Ghanaian public sector?
2. What are some of the cost saving methods enhanced by e-procurement?
3. What e-procurement options can be adopted to optimize cost saving in the public sector?

## **1.4 RESEARCH AIM AND OBJECTIVES**

### **1.4.1 Aim**

The study aims to explore the adoption of e-procurement in the public sector as a tool for cost saving.

### **1.4.2 Objectives**

To realize the aim of the study the following objectives are stated;

1. To identify the roles of procurement in cost saving
2. To determine the cost saving methods that can be enhanced by e-procurement
3. To propose e-procurement options that will optimize cost savings in the public sector

## **1.5 SCOPE OF THE STUDIES**

Geographically, the research was conducted in the Greater Accra Region of the Country. The study was narrowed down to the Chief Procurement and Supply Chain Managers, Principal Procurement Officers, Senior Supply Officers and Supply Officers from Ten (10) different Public Service Ministries namely; Ministries of Finance, Trade and Industry, Communication, Food and Agriculture, Education, Youth and Sports, Energy and Petroleum, Health, Defence and Gender, Children and Social Protection in collecting data for the research. The officers in these Public Sector Ministries were the target respondents. This was to enable the researcher the ease to conduct an in-depth and critical study such that it may provide beneficial information not only to the above-mentioned Public Sector Ministries, but the entire Public Sector to accelerate economic growth as well as cost cutting through e-procurement processes.

Contextually, the study probed into assessing the adoption of e-procurement in the Ghanaian Public Sector and specifically looked at the importance and challenges of adopting e-procurement as a tool for cost saving in the Public Sector.

## **1.6 RESEARCH JUSTIFICATION**

The rate at which internet usage has grown speedily in Ghana has caused the government to add e-commerce to strengthen marketing operations. This was made possible by the use of e-Ghana project which sort to improve technology usage in the public affairs. According to Asare and Prempeh, 2017, it would be appropriate if e-procurement is selected as a component of e-Ghana projects so as to ensure effectiveness and efficiency in the procurement process.

This study therefore will be very relevant currently to the move for digitization in the country and also help improve the cost saving aspect in adopting e-procurement in the Public Sector. It is therefore apparent that this study be conducted to achieve these benefits in the Ghanaian Public Sector.

## **1.7 RESEARCH METHODOLOGY**

The methodology of a research is the foundation upon which a research is based (Brown, 2006). The Quantitative research approach was adopted in the collection of data from respondents. Both primary and secondary sources of obtaining data were used for this study. Primary data was obtained through the use of structured questionnaires designed and administered to respondents of the ten (10) Public Service Ministries in the country. Secondary source of information was from significant course readings, journals and articles and sources from the internet on e-procurement. The sample of the respondents was selected purposively from the ten (10) earlier mentioned Public Service Ministries in the country. Analysis of the data obtained was conducted using descriptive statistics, relative importance index, simple means and one sample t test with the aid of software such as IBM-SPSS 23.0 and Microsoft Excel.

## **1.8 ORGANIZATION OF THE RESEARCH**

This study is structured into five main chapters. Chapter one of the study introduces the background, the research questions, objectives and the aim of the research. Chapter two reviews existent literature on the subject matter and throws light on commentaries and current opinions. Chapter three comprises of the main methodology adopted for the research. It provides a system approach to how the research was conducted. Chapter four makes mention of the analysis and discussion of the data collected from the survey. The main findings of the research will be discussed in this chapter. The outputs of the analysis will be presented in forms that are easy to comprehend. Chapter five basically has to do with the Summary of Findings, Recommendations and Conclusion. Chapter five therefore presents the conclusion drawn from the study and the data analysis and a set of recommendations necessary to improve the current state of the research problem.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This section of the research deals with a review of relevant literature on procurement in general and narrows it down to e-procurement in Ghana. To be able to achieve the research aim, the literature further discusses the objectives under various sub sections. The role of e-procurement as a tool for cost saving, cost saving methods and e-procurement options to improve cost saving have all been reviewed in the literature.

#### **2.2 OVERVIEW OF PROCUREMENT**

There are three different ways by which procurement activities can be defined and grouped. These ways include procuring indirectly, procuring directly, and sourcing (Minahan and Degan, 2001). The selection, purchasing, and the management of supplies for daily running of the company is known as indirect procurement or procuring indirectly. Direct procuring or supply chain management on the other hand involves all activities geared towards the manufacture of finished goods whereas sourcing as includes the activities of both direct and indirect procurement with four a four-phase model namely; information, negotiation, settlement and after-sales (Kim and Shunk, 2003).

Several agencies in the public sector across the globe have identified e-procurement as an important agenda of the government as procurement is seen as the major function of the government. Scholars evaluation of Public e-Procurement initiatives (P e-P) is very limited (McCue and Roman, 2012). This problem of implementing initiatives of e-procurement is believed to occur because as it is in a prime stage (Basheka et al., 2012, Tonkin, 2003). Guidance on the use of this new technology,

system and processes must be provided by organizations as e-procurement is taking prominence in the agendas of government. The introduction of e-procurement by the internet has led to the removal of time lost and errors.

### **2.2.1 Public Procurement in Ghana**

The process by which goods and services, works and other activities from third party are acquired by organizations in the public sector is referred to as public procurement. Much of government's expenditure is always on goods and services. In developing countries, government procurement accounts for 20% to 70% of the country's Gross Domestic Product (GDP) whereas its 10% -15% of the country's GDP in developed countries (Neupane et al., 2014, Kashap, 2004). To leverage economic, technological and social reforms, the government aspires to use public procurement. It has been argued by Burton (2005) that the efficient management of resources of a country can best be done by public procurement as it is an integral tool and a major function of the government. A research conducted by Shakya (2012) identified value-for-money, transparency, competition, non-discrimination, and ethical behaviours as determining factors of a successful procurement.

The efficiency and effectiveness of the public procurement system is important to the growth of the economies of countries in Africa as it shows their eagerness to make proper use of resources of the public (Kabaj, 2008). Kakwezi and Nyeko (2010) argued that it is difficult to determine the effectiveness and efficiency of the procurement department as it is faced with problems with regards to not having access to adequate information on procedures for procurement, inputs, outputs, resource used and outcomes. The existence of these problems call for the provision of clear procurement rules, systematic procuring procedures and a standard to which work must be performed (Asare and Prempeh, 2017).

An assessment in 2007 by the OEC/DAC in Ghana's procurement system although identified significant improvement also mentioned that some provisions in the procurement Act has proved not to have produced any result thereby requires reformation. Incorrect interpretation and application of some provisions of the procurement law, absence of vivid procedure for procuring under emergency, slow pace in regularizing draft regulations, inadequate avenues for training, poor management of records, poor management of complaints from suppliers, poor planning of procurement, poor management of contract and high advertisement cost are some of the problems the procurement Act is faced with (Dza et al., 2013).

### **2.2.2 Definition of E-Procurement**

An application that enables the indirect transaction between suppliers and buyers on the basis of requesting and ordering goods and services to the user, is defined as e-procurement (Gartner, 2012). According to Tatsis et al., (2006) the act of integrating, managing, automating, optimizing, and empowering of the procurement process of an organization through equipment, technology, electronics and web-based application is defined to as e-procurement (Animah et al., 2018). The use of an integrated information technology system for procuring at all stages of the procurement process like, negotiating, ordering, sourcing, acquiring receipt and post-purchase review is referred to as e-procurement (Gunasekaran et al., 2009, Croom & Brandon-Jones, 2004). E-procurement as an application, has played some significant roles in e-commerce as it has been employed to better business processes by many companies (Aberdeen Group, 2001). Mose et al., (2013) has identified cost saving, improved efficiency, measurement and single data entry as some of the benefits associated with the use of e-procurement.

### **2.2.3 E-procurement in Public Sectors**

E-procurement as an information technology tool has had a great influence on the public sector as it has made the purchasing process more responsive and dynamic (Bof and Previtali, 2010). The benefits such as increase transparency, lower cost of administration, and an improved economic outcome in a dynamic and competitive environment has made government agencies turn more to e-procurement (Gascó et al., 2018).

### **2.3 ROLE OF E-PROCUREMENT AS A TOOL FOR COST SAVING**

There are numerous advantages and benefits such in; transaction, compliance, management of information, prices, and payment prices among others that an organization or firm are merits to receive when e-procurement is properly utilized. It is believed that these benefits will contribute massively to the profit, output, and efficiency in the supply process (Eakin, 2003). According to the author, the above merits will be realized when there is a thorough and appropriate process of e-procurement considered.

An organization that has the ability to influence its customers to use e-procurement as a tool to facilitate its transaction is deemed to enjoy several benefits as customers may want to purchase from reliable makers and also benefit customers through several schemes of lowering prices (Mahdillou and Akbary, 2014).

#### **2.3.1 Reduced Operating and Inventory costs**

Reduced Operating and Inventory Costs were the last drivers to be assessed through a survey. Road service was selected for the case study on this research and contractors were surveyed to ascertain the feasibility of this driver in the civil engineering sector (Edie et al., 2007).

### **2.3.2 Improved Market Intelligence and Enhanced Decision Making**

To Hawking et al., (2004), intelligence of the market and its decisions are two distinct drivers. Since reliability of the decision of procurement cannot be made without making mention of the intelligence of the market and each important to the study both has been considered as “Improved Intelligence and Enhanced Decision making”.

### **2.3.3 Gaining Competitive Advantage**

Companies will gain an advantage over its competitors if there is increased profitability. Centralizing functions such as pay roll, procurement, and logistics within the country is a major way by which this can be achieved (NOIE, 2001) since electronic systems are faced with challenges like geographical and time barriers. According to Kalakota (2001), procurement can be undertaken at any time of the day, week and year when e-procurement is adopted. E-procurement has eliminated the act of post documentation between offices since it's now possible for both centralized departments and other offices to oversee all procurement activities across the country. This results in the widening of the supply chains groups geographical boundaries. The issues of logistical consideration are mentioned as the subject of increased group is concerned as it may have some impact on the quality of the scheme. Wong and Sloan (2003) mentioned that obtaining a competitive edge, minimizing cost, and increased profits are noted to be some of the significant benefits of e-procurement when there are improvements in competition. Increased output and greater access to the market are results associated with e-procurement (Rankin, 2006).

### **2.3.4 Reduction in Procurement Staff**

Another advantage that e-procurement provides is by reducing the working staff in carrying out a task. A research undertaken by Egbu et al., 2004 showed that a steel

supplier made use of only 20% of the workers the company would have used to carry out a relatively capital-intensive project. To reduce costs, reducing the number of workers is one of the important means of producing a competitive edge.

### **2.3.5 Lower Administration Costs**

Examination of the rent of facilities is one of the major ways of assessing whether there is a fall in the administration costs or not. Knudson's research in 2003 stated that there will be efficiency in savings if there is adoption in the initiatives of e-procurement. His study could however not match the efficiency of savings compared to other advantages identified from e-procurement. In Canada, a study by Rankin, 2006 showed that reduced paper work and a reduced cost of administration are second ranked major drivers of e-procurement in construction. It has been shown that 33.2% of administrative costs is saved when EPSs is used as against the traditional paper-based processes. The most cost saving effect is obtained through automating requisition generation. This has an indirect impact on net income of the organization (Mahdillou and Akbary, 2014).

### **2.3.6 Reduction in Time to Source Materials**

85% of respondents indicated in a survey in USA that there is time savings in e-procurement. Emphasis on time to market, quality of product competition, customer uncertainty and the need to improve bottom line costs are drivers' product sellers have identified to sourcing materials (Kalakota et al., 2001). Knudson 2003 in Sweden has proved that reduction in time is an important driver by stating that, "E-procurement is a rapid efficient method of finding and connecting new sources, being a lean channel for communication". Comments made by McIntosh & Sloan 2001 in USA and Ribeiro 2001 in UK indicated that there will be significant improvement that could bring speed, flexibility, efficiency, and increased profit margins to organizations when there is an adoption to e-procurement initiatives. Rankin (2006)

showed a reduction in the procurement cycle upon the implementation of e-procurement. Panayioutou et al., (2004) states that there is more efficiency and cost effectiveness to corporate purchasing activities when e-procurement is used. Time reduction therefore is considered an important driver to this study.

### **2.3.7 Price Reduction in Tendering**

Reports from study in the USA indicated time and cost as the most significant determinants for the success of the process of procurement (Edie et al., 2007). Similarly, in 2001 a survey accounted for 75% respondents citing reduction in costs. Hawking et al., (2004) stated that the percentage ranges from 75-80 in Australia. In the UK (Erridge et al., 2001) and in China (Kong et al 2001) also highlighted cost reduction. Rankin (2006) also showed that this driver can be used in the construction industry.

## **2.4 THE INTENTION TO USE E-PROCUREMENT AS COST SAVING TECHNOLOGY**

Reduction in cost and creation of value are benefits to be generated by e-procurement. There are benefits to be realized by companies but other major benefits may seem be attained when officials and departments noted for procurement have a good and clear perception. It is believed that certain critical benefits such as cost reduction, higher efficiency and accuracy, coupled with a speedy processing and delivery of services will be realized when proper e-procurement is implemented. A critical objective of any organization that leads to increase revenue is in cost saving (Mahdilou and Akbary, 2014).

### **2.4.1 Task Improvements**

Evidences has it that the task of purchasing professionally has been improved significantly by e-procurement (Rajkumar, 2001; Olsen and Boyer, 2003). In particular, time on administrative task is minimized drastically and allows for

suppliers to focus on pressing issues (Rajkumar, 2001). Where individuals get to know that using such technology will make their task easier, they will turn to increase purchasing electronically.

#### **2.4.2 Network Connectivity/ Integration**

In order to gain the full benefits available, then it is important that the system of suppliers must be improved to that of the buyer's system thus considering an automation of the transaction process (Rajkumar, 2001; Croom and Brandon-Jones, 2005). Where there is integration in the electronic networks that are reliable, it allows for easy information transfer. Research has it that the performance of e-procurement system is associated to the network connectivity (Croom and Brandon Jones, 2005). This buttresses the point that a reliable and secure connection will influence the intention of an organization to the use of e-procurement. The degree to which the integration is carried out by the supplier's network determines the response from the buyers. It is proposed that if integration is properly considered between suppliers and buyers, there will an increase in the taste of the buyer in purchasing electronically.

#### **2.4.3 Internal Organization Support**

The quest for reducing the cost of an organization and its efficiency is to drive for the adoption of e-procurement (Lancioni et al., 2003). According to (Croom and Brand-Jones, 2005) internal forces are being applied by organizations to increase their hope of obtaining the benefits of e-procurement which is purposed to give hence it is important for internal organizational support to be adopted if e-procurement is going to be implemented successfully. A number of internal forces that influence the adoption has been identified in past researches conducted and such identified forces include; level of staff, training in new technologies, internal motivation from management and department in the aspect of information systems especially

(Osmonbekov et al., 2002), strong finance and resource support (Joo and Kim, 2004), and adequate allocation of budget.

#### **2.4.4 External Organization Pressures**

There can be exertion of pressure on customers by suppliers to use their system and vice versa (Min and William, 1999; Joo and Kim, 2004). This can only occur when there is relatively a power imbalance within the system. When suppliers begin to get as many customers as possible in using the electronic ordering system, they will fully obtain the benefits of e-procurement. Suppliers of high-level influence may find it easy implementing this application as they can decide to ignore buyers who would not want to make use of it. Similarly, powerful buyers will as well threaten to neglect the purchase of goods if suppliers are not providing the electronic means for purchasing. Exerting pressure on buyers by suppliers to use this new technology will only sell out when the buyer's only source of purchasing is from that particular supplier. But where there are several other sources from which the buyer can obtain the same product, the buyer can resist this pressure and purchase elsewhere which forms the negative effect. Researchers have considered that it will be appropriate to postulate that coercive supplier force will have an impact on the intention of the buyer in using e-procurement.

#### **2.4.5 Supplier Participation and Intentions**

In an attempt to lower costs, improve communication, and get operational efficiencies, suppliers put pressure on customers to use E-commerce (Kennedy and DeeterSchmelz, 2001). Although beneficial to suppliers, buyers are not happy with the strength of the online purchasing from their suppliers. It was found out by the Institute of Supply Management (ISM)/Forrester survey that 36.6% of the manufactures were not pleased with the capability of their suppliers as they were rated very bad (Olsztynski, 2003). Yet for online procurement to be complete, both

the buyer and supplier need to be connected via an internet. In order to ensure participation in the use of this technology, some suppliers provide some financial and non-financial forms of encouragement to their buyers. Some examples of financial encouragement that a buyer obtains when goods are purchased electronically often are in forms of lower prices on goods purchased on discounts whereas training periods, designed Web fronts, and other services are forms of non-financial encouragement provided by some suppliers (Croom, 2001; Deeter-Schmelz et al., 2001). In general, research has it that the support provided by suppliers has great impact on the adoption of E-commerce for business transaction (Deeter-Schmelz et al., 2001). The strategies and eagerness of suppliers to use this technology has been seen in the buyer's attitude to also use this technology as well for purchasing.

## **2.5 E-PROCUREMENT OPTIONS TO IMPROVE COST SAVINGS**

The use of Information and Communication Technology (ICT) such as the internet or web-based systems developed to make it easier to obtain goods and services by the public is referred to as Electronic procurement (Davila et al., 2003). E-procurement has played a major role as far as success in management of public resource is mentioned (Mahmood, 2010) and as well as enhancing the transparency and accountability of procurement by government (Croom & Brandon-Jones, 2005, Panda et al., 2010).

### **2.5.1 Improving Individual Skills**

In making use of electronic means of purchasing, it is important that the skills of such individuals are improved. ICT related perception, skills and capabilities of employees in government agencies are individual factors or internal factors which are related to individuals (Altayyar and Beaumont-Kerridge, 2016) and as such must be considered. Where there are innovations with regards to an easier way of using this technology and its usefulness, it motivates individuals to make use of it (Jung

and Lee, 2016). According to Li and Feency, 2014, the technology can only be adopted and implemented by the organization when employees show a form of eagerness to accept it. The employees' ability to use existing computer applications and an exposure of previous technology and networking are important assets to the employees' ICT skills. The communication and managerial skills of an individual are major contributors in building networks among stakeholders beside their ICT skills (Gascó et al., 2018).

### **2.5.2 Improving Interoperability**

The provision of information on procurement via the internet raises the concern of interoperability. This is so as software companies have intended to distinguish their product. In other to do so, there is the need to halt data migration between systems. To solve this challenge, the Construction Industry Trading Electronically (CITE) was initiated. However, it has been found out that less than 30% of the prescribed systems of CITE has been used in the construction industry. According to Rankin 2006, technical issues such as compatibility, interfacing with other systems have become barriers to the implementation of e-procurement.

### **2.5.3 Security of Transaction**

A major concern to consider when working on the internet is security. According to Jennings (2001), the World Wide Web (www.) leaks like a sieve. This is because the data transmitted via it can be distorted, or appear differently at the other end, or show partially due to software being incompatible. This problem exists and as such many financial institutions have put up systems and solution to curb it. According to the Bank for International Settlements (BIS), security should be provided to enhance control and monitoring of transactions, records and information. Rankin (2006) indicated that system breaches are critical challenges about e-procurement that needs to be addressed. Although security measures have been put in place by financial

institutions, this study reveals that this problem is a major limitation to e-procurement.

#### **2.5.4 Automation of Creating Requisitions**

E-procurement has provided lots of benefits in regards to minimizing cost and a means to which this can be realized is through creating systems that can saving cost. The use of e-procurement has made it easier for new suppliers to be found which bears the cost saving effect. This is seen in the light of reducing the time needed for sourcing thereby decreasing inventory which results in minimizing the cost related to storage. In addition, the use of e-procurement will improve the cost components of companies when items for maintenance, repair and operating resources are purchased (Gascó et al., 2018).

#### **2.5.5 Developing a Public E-procurement Strategy**

Governments should develop plans or strategies for the implementation of e-procurement and step up a reliable and competent board of executives who will be able to develop and enforce the implementation policies of e-procurement. The focus of this is to centralize e-procurement system so as to facilitate monitoring, transparency and accountability, an easier means to obtaining information, and ensure consistency among bidders and government agencies. As a result, it helps to increase cost savings (Neupane et al., 2014).

#### **2.5.6 Time Management**

The use of e-procurement has increased the efficiency in the supply process via the effective management of time that ensures that ordered goods are delivered to clients not too early or too late but at desired time of clients. The helps eliminate costs of inventory and storage with which the production process is not affected in case of too late delivery (Mahdillou and Akbary, 2014).

### **2.5.7 Improved Managerial Skills**

The desire to improve the delivery service is a major consideration of many governments (Kaliannan et al., 2009, Vaidya and Hyde, 2011; Basheka and Sabiiti, 2011) hence the adoption of e-procurement which is a significant tool to increase competition in the nation (Basheka et al., 2012) and a means to attain benefits such as transparency and accountability. E-procurement also contributes to minimizing costs and time as a result of a better management and contractual control system (Karthik and Kumar, 2013).

### **2.5.8 Sharing Real Time Information**

The use of e-procurement systems will enable suppliers share extremely important information on both company and supplier. An advantage to this is that, when this extreme information is shared, there would not be complexity in designing products hence reduction in cost and value creation. This however has become the key to which every company is striving to achieve (Mahdillou and Akbary, 2014).

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 INTRODUCTION**

The chapter three of this research describes the procedural approach to the research. It highlights all the stages and step by step processes involved in the research. The research approach, methods and design, primary data collection, analysis and presentation for the intent of addressing the issues captured in the aim and objectives of the research. This chapter also explains the data analysis method used in analysing the primary data and how the sample size for the research was computed. The general approach adopted to address the research aim and objectives are highlighted in this section.

#### **3.2 RESEARCH DESIGN**

The quality of any research project is enhanced by a good understanding of the research design and this study was based on cross-sectional survey to carry out the study (Nwana, 2008). The survey approach refers to a group of methods which emphasizes exploratory and quantitative analysis, where data for the study are collected through methods such as questionnaires, face-to-face and telephone interviews, and these data are analysed using statistical techniques. This design is chosen because it is deemed to be more practical and appropriate in investigating the full nature of the phenomena rather than simply observing and explaining the phenomena.

The research adopted a questionnaire survey in the quest to explore and assess the adoption of e-procurement in the public sector as a tool for cost saving. Questionnaire survey enhances consistency of observations and improves replication due to its inherent standardized measurement and sampling techniques (Norris et al., 2008).

## **3.2 RESEARCH STRATEGY**

This section elaborates amongst others the philosophical position of the research, the strategy or tactics adopted and reasons for such strategies and the research process. Naoum (2007) defines research strategy as the enquiry of research objectives. The two main traditional research strategies are discussed in this section. The quantitative and the qualitative strategies will be elaborated describing their differences in approach and what they involve, and the reasons why the quantitative method was chosen for this research. The justification of the research strategy adopted in this research will be enlightened.

### **3.2.1 Quantitative Research**

According to Bryman (2004), quantitative research is a research tactic that emphasizes the measurement and quantification in collection and data analysis. Quantitative research was outlined as a distinctive research strategy. The specific truth that it has an unmistakable epistemological and ontological position proposes that there is significantly more to it than the insignificant nearness of numbers (Bryman, 2006). The study used this approach in collecting data using questionnaires.

### **3.2.2 Qualitative Research**

According to Berg et al. (2004) meanings, concepts, definitions, characteristics, metaphors, symbols and descriptions of things can be referred to as qualitative research. Qualitative research can be used for investigating human behaviour which is to help the researcher understand the different opinions and pay attention to crucial contextual characteristics of the data. (Bell & Bryman, 2007).

### **3.2.3 Mixed Approach**

The mixed approach is the combination of both qualitative and quantitative research. The mix explores the advantage of both the qualitative and quantitative research.

### **3.3 RESEARCH POPULATION AND SAMPLING TECHNIQUE**

#### **3.3.1 Target population**

The field research targeted data and information from procurement professionals from Ten (10) Public Sector Ministries in the Country.

#### **3.3.2 Sample and Sampling Techniques**

A sample is a part of a population that is studied to learn more about the population. Kumar (1999) explains that a sample is a sub-group of the population which is an ideal representative of the entire population. Researchers usually cannot make direct observations of every individual in the population they are studying. Instead, they collect data from a subset of individuals (a sample) and use those observations to make inferences about the entire population (Zickmund 1991). The study used purposive sampling technique to collect data from ten Public Sector Ministries including Ministries of Finance, Trade and Industry, Communication, Food and Agriculture, Education, Youth and Sports, Energy and Petroleum, Health, Defence and Gender, Children and Social Protection.

##### **3.3.2.2 Purposive Sampling**

This is a technique in which the researcher, based on his knowledge and understanding of the population, handpicks certain groups or individuals for their relevance to the subject of investigation. These individuals have the knowledge on e-procurement based on their years of experience in the subject area. The respondents included chief Procurement and Supply Chain Managers, Principal Procurement Officers, Senior Supply Officers and Supply Officers. The major advantage of adopting purposive sampling lies in the fact that it gives a great possibility for the participation of those considered very crucial to data collected in a given study. However, those selected were not likely to be representative of some clearly specified population of more general interest.

A purposive sampling method was used to select some of the professionals and experts because the researcher has knowledge of some of the procurement professionals in the selected Public Sector Ministries. They were contacted and questionnaires administered to them for responses.

### **3.4 DATA COLLECTION METHOD**

This section elaborates how the research data was gathered. Patton (2002) captured that using more than one source of data helps in credibility of the study. According to Bernard (2002), data gathering is crucial in research, as the data contributes to a better understanding of a theoretical background. Primary data and secondary source of information was used for the study.

#### **3.4.1 Primary Data Source**

Primary source of data is the data obtained directly from field surveys. Field work according to Naoum (2007) can be associated with three practical approaches; the survey approach, the case study approach and the problem-solving approach. The case study approach was used for this research where primary data was collected from procurement professionals in the Ministries. A case study is an empirical enquiry that allows for investigation of dynamics of a particular system and it is the most economical and convenient for the study (Hagget et al., 1977).

### **3.5 DATA COLLECTION INSTRUMENT**

Analytical review of literature was conducted to obtain information in developing the research instrument. The research instrument was designed to address the research aim and objectives as well as answer the research questions for the study. A close ended questionnaire was developed for professionals and experts in the knowledge of the study.

### **3.5.1 Questionnaire Design**

As described earlier, the format of the questionnaires which were aligned to meet the objectives of this research has four main parts or sections. Part one deals with the characteristics of the respondents. Part two looks at the role of procurement in cost saving. Part three also ranks the cost saving methods that can be enhanced by e-procurement to be rated by the respondents using the Likert scale. Part four of the questionnaire describes the e-procurement options that will optimize cost saving.

### **3.5.2 Questionnaire Administration**

The medium of administering the questionnaires was in person. The purpose of the study was explained to the respondents for clarity which paved way for the researcher to retrieve most of the questionnaires from the respondent without difficulty. The instructions for completing the questionnaires explicitly appeared on the instrument; therefore, no further instructions were needed in distributing the questionnaires. The researcher also availed himself to the respondents to answer questions that might bother them whiles using the instrument. It took the researcher three weeks to collect the data from the respondents.

## **3.6 ANALYSIS OF THE DATA**

The responses from the questionnaires were analysed using frequencies and percentages, with the use of Statistical Package for Social Science (IBM SPSS Statistics 20) and Microsoft Excel software package. To ensure consistency, the responses of the questionnaires were edited and coded. The responses for the open-ended questions were grouped based on common ideas that the respondents expressed. The results were presented using descriptive statistics, thus Relative Importance Index (RII) and Mean Score Ranking.

### 3.6.1 Relative Importance Index

Relative Importance Index helps in the identification of the hierarchy of variables. The nearer the value of importance index of the identified factors is to a unit or one (1), the most harmful effect of the issues in construction industry of Ghana and hence the need to find pragmatic solution to improve the issue. The importance indices obtained were ranked to ascertain the most frequent effects. The relative importance index (R.I.I) was calculated using the following formula (Fagbenle et. al., 2004).

$$\text{Relative Important Index (R.I.I)} = \frac{\sum P_i U_i}{N(n)}$$

Where, R.I.I = Relative importance index

$P_i$  = respondent's rating of effects experienced by contractors

$U_i$  = number of respondents placing identical weighting/rating on the effects of payment delays

$N$  = sample size

$n$  = the highest attainable score (i.e. 5)

### 3.6.2 Mean Score Ranking

Mean score ranking was used to determine the factors that were relatively significant for the study by ranking and comparing the variables mean score in descending order according to their significance. The mean score was used to eliminate the less significant variables during the structural equation modelling. The formula in the next page was used to compute the mean score;

$$MS = \frac{\sum(f \times s)}{N}$$

$$, (1 \leq MS \leq 5)$$

Where  $N$  = the total number of responses

$f$  = the frequency of rating score

$s$  = the rating score

## **CHAPTER FOUR**

### **DATA ANALYSIS AND DISCUSSION**

#### **4.1 INTRODUCTION**

The previous chapter dealt with the methodology undertaken for the distribution of the questionnaires and more so the type of analysis to be conducted on the collected data. This section therefore confirms the analysis by conducting various analysis on the data collected to achieve the aim of the study. The characteristics of the respondents is first analysed to ascertain the validity and reliability of the responses retrieved from the respondents. The various objectives are also analysed using one sample t-test, mean score ranking and relative importance index. The analysed data are moreover discussed after the analyses. Below is an illustration and discussion of the various analysed data from the respondents.

#### **4.2 RESPONDENT CHARACTERISTICS**

It was necessary for the researcher to enquire from the respondents some information to assure the researcher of the reliability and validity of the responses received from them. The questions for the respondents on their demographics involved their educational level, working experience, their profession, whether they had a procurement department and the officers they have in their procurement department. The Table 4.1 in the next page is an analysis of the characteristics using frequencies and percentages. The discussion of the table is further explained.

Table 4.1: Respondents characteristics

		<b>Frequency</b>	<b>Percent</b>
<b>Educational Level</b>	Bachelor's Degree	37	82.2
	Masters / Postgraduate Degree	8	17.8
<b>Working Experience</b>	1 – 5 years	6	13.3
	6 - 10 years	14	31.1
	11 – 15 years	10	22.2
	16 years and above	15	33.3
<b>Procurement Unit</b>	Yes	45	100
	No	0	0
<b>Officers in the Procurement Unit</b>	1 – 5 personnel	39	86.7
	6 - 10 personnel	5	11.1
	11 – 15 personnel	1	2.2
<b>Total</b>		<b>45</b>	<b>100</b>

*Source: Field Survey (2018)*

The educational level of the respondents was either a bachelor's degree or a master/postgraduate degree. From the table, thirty-seven out of the forty-five respondents had a bachelor's degree representing 82.2 percent. The masters/postgraduate degree holders were about eight also constituting 17.8 percent of the respondents. This qualification shown by the respondents was an assurance to the researcher because of their ability to understand the questionnaire and provide the necessary responses needed. The working experience of the officers was also needed to confirm their capacity to answer the questions. Six of the officers had one to five years working experience constituting a percentage of 13.3. Fourteen of the respondents had six to ten years working experience representing 31.1 percent. Respondents with eleven to fifteen years working experience were ten constituting a percentage of 22.2. Fifteen of them had 16 years and above working experience representing 33.3%. On the issue of whether they had a procurement department that sees to procurement, they all replied yes confirming that all the respondents were procurement officers working in a procurement department. The number of officers in the department was also verified. Most of the respondents thus thirty-nine affirmed that they had one to five officers in their procurement department, which represents 86.7 percent. Five of them had six to ten officers in their department and only one

person had eleven to fifteen officers in his office constituting a percentage of 11.1 and 2.2 respectively. The qualifications of the respondents represented those officers who were qualified enough to provide the researcher with the needed information requested.

#### **4.3 ROLES OF PROCUREMENT IN COST SAVING**

A review of related literature on the topic identified seven roles of procurement in cost saving. These roles were used to design a questionnaire. The questionnaire was designed on a five-point Likert scale with strongly disagree as the least and strongly agree as the highest. Using one sample t-test and mean score ranking, the roles were ranked and their significance also computed. The analysis and discussions are explained below.

**Table 4.2: Roles of Procurement in Cost Saving**

<b>Role of Procurement</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>T</b>	<b>Df</b>	<b>Sig. (2-tailed)</b>	<b>Rank</b>
Reduced Operating and Inventory costs	4.09	0.288	25.381	44	0.000	<b>1</b>
Gaining competitive advantage	4.04	0.208	33.618	44	0.000	<b>2</b>
Reduction in time to source materials	4.02	0.149	46.000	44	0.000	<b>3</b>
Improved market intelligence and enhanced decision making	3.98	0.452	14.521	44	0.000	<b>4</b>
Lower Administration costs	3.40	0.809	3.317	44	0.002	<b>5</b>
Price reduction in tendering	3.36	1.004	2.377	44	0.022	<b>6</b>
Reduction in procurement staff	2.53	1.014	-3.089	44	0.003	<b>7</b>

\*\*Significant

*Source: Field survey (2018)*

The table shows the ranking of the role procurement play in cost saving. The first ranked role is reduced operating and inventory costs having a mean value of 4.09 and a standard deviation of 0.288. The second ranked role is gaining competitive advantage having a mean value of 4.04 and a standard deviation of 0.208. The third ranked role is reduction in time to source materials having a mean value of 4.02 and a standard deviation of 0.149. The fourth ranked role is improved market intelligence and enhanced decision making having a mean value of 3.98 and a standard deviation of 0.452. The fifth ranked role is lower administration costs having a mean value of 3.40 and a standard deviation of 0.809. The sixth ranked role is price reduction in tendering having a mean value of 3.36 and a standard deviation of 1.004. The seventh ranked role is reduction in procurement staff having a mean value of 2.53 and a standard deviation of 1.014. The various roles were again tested for their significance. Using a test value of three and 95% confidence level, one sample t-test was conducted on the roles. For the roles to be deemed significant, the p value of the roles should be less than 0.05. It is deemed not significant if the p value is greater than 0.05. In this case, all the roles were deemed significant. This shows that, all the roles are very important cost saving roles in e-procurement.

The study affirms the research by Edie et al. (2007) that reduced operating and inventory costs were important drivers to be assessed through a survey where road service was selected for the case study on this research and contractors were surveyed to ascertain the feasibility of these drivers in the civil engineering sector. Wong and Sloan (2003) also mentioned that obtaining a competitive edge, minimizing cost, and increased profits are noted to be some of the significant benefits of e-procurement when there are improvements in competition. Increased output and greater access to the market are results associated with e-procurement (Rankin, 2006). Knudson (2003) in Sweden has also proved that reduction in time is

an important driver by stating that, “E-procurement is a rapid efficient method of finding and connecting new sources, being a lean channel for communication”.

#### **4.4 COST SAVING METHODS THAT CAN BE ENHANCED BY E-PROCUREMENT**

To determine the cost saving methods that can be enhanced by e-procurement, the researcher reviewed existing literature to come up with five cost saving methods that can be enhanced by e-procurement. Using the same questionnaire, the respondents were asked to rate the various cost saving methods and the one they think in their opinion is being enhanced by procurement. Using mean score ranking, the methods were ranked from one to five. The methods were also passed through the one sample t-test to affirm the significance of those methods as cost saving methods that can be enhanced by e-procurement. The table below shows an illustration of the analysis and the discussion also follows.

**Table 4.3: Cost saving methods that can be enhanced by e-procurement**

<b>Cost Saving Methods</b>	<b>Mean</b>	<b>Std. Deviation</b>	<b>t</b>	<b>Df.</b>	<b>Sig. (2-tailed)</b>	<b>Rank</b>
Task Improvements	4.13	0.344	22.115	44	.000**	<b>1</b>
Network Connectivity/Integration	4.09	0.358	20.394	44	.000**	<b>2</b>
Supplier Participation and Intentions	4.07	0.252	28.365	44	.000**	<b>3</b>
Internal Organizational Support	3.98	0.543	12.077	44	.000**	<b>4</b>
External Organizational Pressures	3.42	0.657	4.313	44	.000**	<b>5</b>
**Significant						

*Source: Field survey (2018)*

The five identified cost saving methods are discussed below. Task improvements is the first cost saving method with a value of 4.13 as its mean and having a standard deviation of 0.344. Network connectivity/integration is the second cost saving method with a value of 4.09 as its mean and having a standard deviation of 0.358. Supplier participation and intentions is the third cost saving method with a value of 4.07 as its mean and having a standard deviation of 0.252. Internal organizational support is the fourth cost saving method with a value of 3.98 as its mean and having a standard deviation of 0.543. External organizational pressures are the fifth and last cost saving method with a value of 3.42 as its mean and having a standard deviation of 0.657. The various methods were again tested for their significance. Using a test value of three and 95% confidence level, one sample t-test was conducted on the methods. For the methods to be deemed significant, the p value of the methods should be less than 0.05. It is deemed not significant if the p value is greater than 0.05. In this case, all the cost saving methods were deemed significant. This shows that, the cost saving methods identified are one way or the other being improved by e-procurement.

This research buttresses the evidences of Rajkumar (2001) explaining that the task of purchasing professionally has been improved significantly by e-procurement (Olsen and Boyer, 2003). In particular, time on administrative task is minimized drastically and allows for suppliers to focus on pressing issues (Rajkumar, 2001). It is believed that where individuals get to know that using such technology will make their task easier, they will resort to increasing purchasing electronically. Research has it that the performance of e-procurement system is associated with the network connectivity (Croom and Brandon Jones, 2005). This buttresses the point that a reliable and secure connection will influence the intention of an organization to the use of e-procurement. In an attempt to lower costs, improve communication, and get

operational efficiencies, suppliers put pressure on customers to use E-commerce (Kennedy and Deeter Schmelz, 2001).

#### 4.5 E-PROCUREMENT OPTIONS THAT WILL OPTIMISE COST SAVINGS

The last objective was to propose e-procurement options that will optimize cost savings in the Public Sector. To satisfy that objective, there was a review of pertinent literature on the subject area. Eight options were identified and designed into a questionnaire for the respondents to rate them from one to five on a Likert scale. The mean score ranking and relative importance index were used in the analyses of these options. The outcome of the results is shown in the table below. The discussions therefore follow the illustrations shown in the table below.

**Table 4.4: E-procurement options that will optimise cost savings**

No	Options	( $\Sigma W$ )	Mean	RII= $\Sigma W/(5*N)$	Rank
1	Sharing real time information	214	4.756	0.951	<b>1</b>
2	Time management	210	4.667	0.933	<b>2</b>
3	Automation of creating requisitions	208	4.622	0.924	<b>3</b>
4	Security of transactions	200	4.444	0.889	<b>4</b>
5	Improving Individual Skills	190	4.222	0.844	<b>5</b>
6	Improving Interoperability	182	4.044	0.809	<b>6</b>
7	Developing a public e-procurement strategy	163	3.622	0.724	<b>7</b>
8	Improved Managerial Skills	158	3.511	0.702	<b>8</b>

*Source: Field survey (2018)*

The relative importance index was used in analysing the various options in optimising cost savings using e-procurement. It can be observed from the table that; the first ranked option received a relative importance index of 0.951 which is sharing real time information also having a mean value of 4.756. The second ranked option received a relative importance index of 0.933 which is time management also having a mean value of 4.667. The third ranked option received a relative importance index of 0.924 which is automation of creating requisitions also having a mean value of

4.622. The fourth ranked option received a relative importance index of 0.889 which is security of transactions also having a mean value of 4.444. The fifth ranked option received a relative importance index of 0.844 which is improving individual skills also having a mean value of 4.222. The sixth ranked option received a relative importance index of 0.809 which is improving interoperability also having a mean value of 4.044. The seventh ranked option received a relative importance index of 0.724 which is developing a public e-procurement strategy also having a mean value of 3.622. The eighth ranked option received a relative importance index of 0.702 which is improved managerial skills also having a mean value of 3.511.

According to Mahdillou and Akbary (2014) the use of e-procurement systems will enable suppliers share extremely important information of both company and supplier. An advantage to this is that, when this extreme information is shared, there would not be complexity in designing products hence reduction in cost and value creation. This however has become the key to which every company is striving to achieve. The use of e-procurement has increased the efficiency in the supply process via the effective management of time that ensures that ordered goods are delivered to clients not too early or too late but at desired time of clients. This helps eliminate costs of inventory and storage with which the production process is affected in case of too late delivery (ibid). E-procurement has provided lots of benefits in regards to minimizing cost and a means to which this can be realized is through creating systems that can save cost. The use of e-procurement has made it easier for new suppliers to be found which bears the cost saving effect. This is seen in the light of reducing the time needed for sourcing thereby decreasing inventory which results in minimizing costs related to storage. In addition, the use of e-procurement will improve the cost components of companies when items for maintenance, repair and operating resources are purchased (Gascó et al., 2018).

## **CHAPTER FIVE**

### **CONCLUSION AND RECOMMENDATION**

#### **5.1 INTRODUCTION**

This chapter summarises the various objectives into how these objectives were met through the analysis of the data. The findings of the research are then stated and the final conclusion of the work made. The chapter also makes recommendation to academia and practitioners on e-procurement in achieving cost saving. The limitation of the work is then stated with the direction for future studies also discussed. All the aforementioned are discussed below.

#### **5.2 SUMMARY OF FINDINGS**

The findings of the research were discussed in chapter four. The summary is outlined in the ensuing paragraphs:

The results revealed that; reduced operating and inventory costs, gaining competitive advantage and reduction in time to source materials were the three highest ranked roles. Nonetheless, all the roles passed the significance test using one sample t-test.

The results of the analysis revealed the three highest ranked cost saving methods which were task improvements, network connectivity/integration and supplier participation and intentions. The five identified methods also passed the significance test with their p value being less than 0.05.

The results of the data analysis using the relative importance index and the mean score ranking revealed the ranking of each of the options. The first three were; sharing real time information, time management and automation of creating requisitions. The last ranked option was improved managerial skills, which still had a high mean value and relative importance index.

### **5.3 FINDINGS**

The analysis of the data came up with a lot of critical findings for practice and also for academia. The finding of the study is discussed below;

- It was observed that, all the respondents had a procurement unit with mostly about one to two procurement officers which is quite good. Their qualifications were also great in achieving a valid and reliable research.
- The test of significance using one sample t-test on the first objective was realized to be positive for all the roles which meant that, all the roles had a p value less than 0.05. This shows the importance of each role play in achieving cost saving in procurement.
- All the methods of cost saving had their p-values being greater than 0.05. This also meant that the identified methods were important cost saving methods, which can be enhanced by e-procurement.
- A relative importance index and mean score ranking of the third objectives came up with the rankings of the options for optimizing the cost of e-procurement operations. The five highest options are; sharing real time information, time management, automation of creating requisitions, security of transactions and improving individual skills. All the other three options also had high Relative Important Indexes and mean values showing their importance as well.

### **5.4 CONCLUSION**

In developing countries, public procurement often constitutes the largest domestic market. The public procurement system has a contributing factor to the economic development of a country depending on how it is managed. E-procurement has

become one of the largest drivers of change in any industry, with the objective of achieving value for money.

The results of the research revealed that e-procurement helps to reduce operating and inventory cost, increases competitor advantage and helps to reduce the time used in sourcing for materials. In addition, the study found out that task improvement, network connectivity/integration and supplier participation and intentions are vital methods which when adopted help to reduce or save cost.

Finally, the study revealed that when real time information is shared in a timely manner when creating requisitions there would not be complexity in designing products hence reduction in costs and consequently serve as an option to optimise cost savings.

It can therefore be concluded that, the introduction of e-procurement in the Public Service Ministries in the country and to a larger extent other Departments and Agencies has a great potential to significantly lead to cost and administrative savings associated procurement transactions.

## **5.5 RECOMMENDATION**

The research recommends that, practitioners especially procurement officers take this opportunity to gain knowledge in e-procurement and its use as it will help them a lot. It is also recommended that all the options identified such as sharing real time information, time management, automation of creating requisitions, security of transactions, improving individual skills, improving interoperability, developing a public e-procurement strategy and improved managerial skills be put into practice to aid in efficient savings when it comes to procurement. To academia, the research serves as a good recommendation and addition to research and knowledge as well as a source of literature for researchers.

## **5.6 LIMITATION**

Every research comes with its own challenges because of the inability of the researcher to reach the entire population. The limitation to this research is the idea of selecting a few out of all the procurement officers in the country. The unavailability of some of the respondents to provide constructive responses was also a major setback.

## **5.7 DIRECTION TO FUTURE RESEARCH**

It is recommended that, further research could be undertaken in other parts of the country and other Public Service Ministries if the same subject area is to be studied. Other aspects of procurement can also be researched into especially when it comes to corruption in the procurement process as it has become a huge problem recently.

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## APPENDIX

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,  
KUMASI  
COLLEGE OF ART AND BUILT ENVIRONMENT  
FACULTY OF BUILT ENVIRONMENT  
DEPARTMENT OF BUILDING TECHNOLOGY  
(Master of Science in Procurement Management)**

### **SURVEY QUESTIONNAIRE**

*(This questionnaire has been designed to aid in collecting relevant information necessary for this research for the completion of Master of Science degree in Procurement Management in KNUST, Department of Building Technology. This questionnaire is to achieve the aim of exploring the adoption of e-procurement in the public sector as a tool for cost saving. I will be very grateful to you if you could give us part of your valuable time in responding to the following questions. Your opinions will only be used for this study only and as well kept confidential)*

#### **Research Topic:**

***Exploring the Adoption of E-procurement in the Public Sector as a  
Tool for Cost Saving: A Case Study of Ten (10) Public Service  
Ministries in Ghana***

#### **By:**

**GODWIN PALAS DAMALIE**

**Tel.: 0244656147**

**Email: [gdamalie@mofep.gov.gh](mailto:gdamalie@mofep.gov.gh)**

*Please, kindly respond to the questions by ticking [√] in the appropriate box for each item.*

**A. RESPONDENT CHARACTERISTICS**

1. What is your educational level?

Diploma / Professional Certificate [ ]

Bachelor's Degree [ ]

]

Masters / Postgraduate Degree [ ]

PhD [ ]

2. How many years of working experience do you have in the field of procurement?

1 – 5 years [ ]

6 - 10 years [ ]

11 – 15 years [ ]

16 years and above [ ]

3. Does company have a procurement unit?

Yes [ ]

No [ ]

4. If yes, how many officers are in your procurement unit?

1 – 5 personnel [ ]

6 - 10 personnel [ ]

11 – 15 personnel [ ]

Above 15 personnel [ ]

5. Which professional body are you affiliated to?

.....

## B. ROLES OF PROCUREMENT IN COST SAVING

6. Please rate the following objective of the role procurement play in cost saving by ticking once (√) as appropriate for the following in order of degree of agreement. **KEY: 1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree**

Item	Role of Procurement	Rankings				
		1	2	3	4	5
1	Reduced Operating and Inventory costs					
2	Improved market intelligence and enhanced decision making					
3	Gaining competitive advantage					
4	Reduction in procurement staff					
5	Lower Administration costs					
6	Reduction in time to source materials					
7	Price reduction in tendering					
Other, please specify						
8						
9						
10						

## C. COST SAVING METHODS THAT CAN BE ENHANCED BY E-PROCUREMENT

7. Please rate the following objective of the cost saving methods that can be enhanced through e-procurement by ticking once (√) as appropriate for the following in order of degree of agreement. **KEY: 1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree**

Item	Cost Saving Methods	Rankings				
		1	2	3	4	5
1	Task Improvements					
2	Network Connectivity/Integration					
3	Internal Organizational Support					
4	External Organizational Pressures					
5	Supplier Participation and Intentions					
Other, please specify						
6						
7						

**D. E-PROCUREMENT OPTIONS THAT WILL OPTIMISE COST SAVINGS**

8. Please rate the following objective of the e-procurement options that will optimize cost saving by ticking once (√) as appropriate for the following in order of degree of agreement. **KEY: 1 = Strongly disagree 2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly agree**

Item	Options	Rankings				
		1	2	3	4	5
1	Improving Individual Skills					
2	Improving Interoperability					
3	Security of transactions					
4	Automation of creating requisitions					
5	Developing a public e-procurement strategy					
6	Time management					
7	Improved Managerial Skills					
8	Sharing real time information					
Other, please specify						
9						
10						
11						

**THANK YOU**