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KUMASI

**DEPARTMENT OF BUILDING TECHNOLOGY
COLLEGE OF ARCHITECTURE AND PLANNING**

**THE ACCEPTANCE OF E-PROCUREMENT IN GHANA: A STUDY OF
KEY STAKEHOLDERS IN THE CONSTRUCTION INDUSTRY IN
GREATER ACCRA**

BY

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**THIS DISSERTATION IS SUBMITTED TO THE DEPARTMENT
OF BUILDING TECHNOLOGY, IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE AWARD OF DEGREE OF MASTER OF
SCIENCE IN PROCUREMENT MANAGEMENT**

NOVEMBER, 2014

DECLARATION

I hereby declare that, this project report is the result of my own work, except for the literature whose sources have been explicitly stated and that, this thesis has neither in whole nor in partly been prescribed by another degree elsewhere.

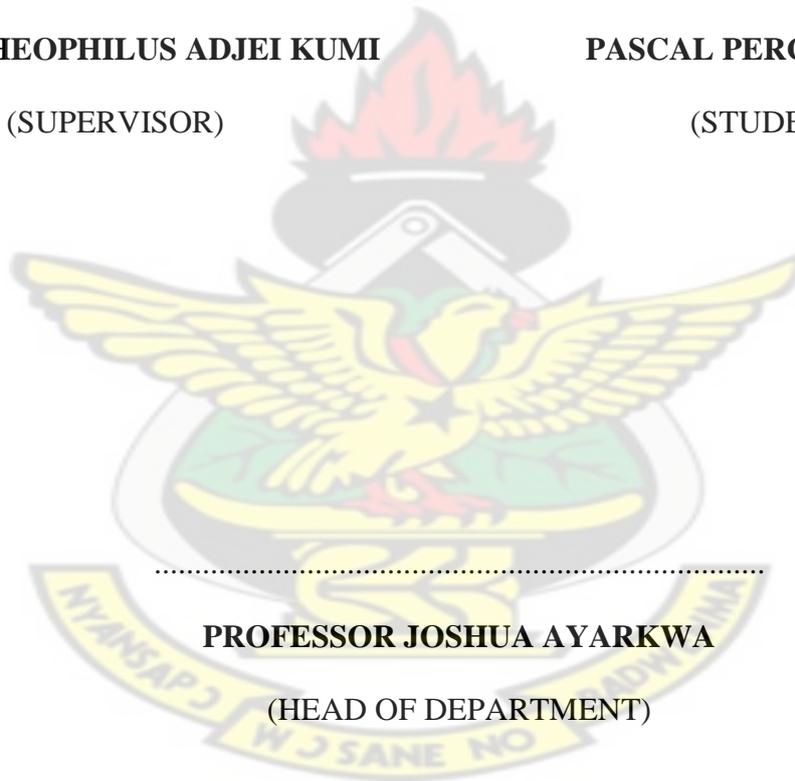
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ABSTRACT

The Public Procurement Act of 2003 was intended to harmonise public procurement processes, secure judicious, economic and efficient use of state resources and ensure that public procurement is fair, transparent and non-discriminatory. The research seeks to find out the acceptance of e-procurement on the local construction industry in Ghana.

By policy or practice, the increasing numbers of Government Department in Ghana are mandating the use of information technology (IT) to administer and deliver service to public. Many institutions achieve, or expect to achieve, enhanced procurement service and productivity by using advance technologies in e-Procurement. The research community relies increasingly on e-Procurement-enabler users that massively registered to equip with the system. The effectiveness of the public delivering service regarding procurement is a relevant topic of discussion among the clients. Taking into consideration the gap in the literature, a study has been carried out on the acceptance of e-Procurement in the construction industry in Ghana and the factors that leads to the adoption of e-procurement in the sector as well as the challenging factors that inhibit the acceptance of e-procurement.

The factors that lead to the acceptance of e-Procurement system are the framework of this research. Therefore, this research will focus on these factors as the moderating effect towards satisfaction level among the users.

DEDICATION

I wholeheartedly dedicate this research work to the Lord Almighty through whose guidance and protection I have been able to reach this far in my education.

Secondly to parents Mr. and Mrs Akibate, my entire family and friends for their prayers and support.

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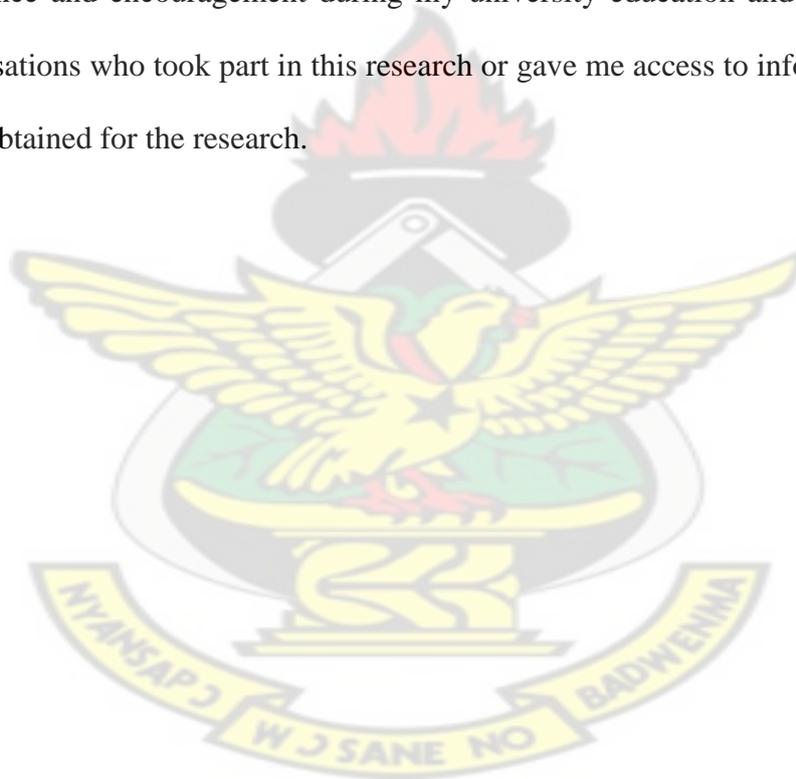


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CHAPTER ONE

GENERAL INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Government bodies from all over the world both developed and developing countries spend a lot on goods and services to deliver public service effectively and efficiently, as well as to achieve value for money for the good of the taxpayers. The processes and techniques that these countries, individuals and the cooperate world generally employ is quiet interesting hence the need to study it.

Public procurement in Ghana represents about 24% of total expenditure; public procurement represents 50 to 70% of the national budget and 14% of Gross Domestic Product (GDP) according to a study cited by Adjei (2006). The annual value of public procurement for goods, works, and services according to studies was about US\$600 million (World Bank, 2003).

Electronic procurement or e-Procurement refers to the use of Internet-based (integrated) information and communication technologies (ICTs) to carry out individual or all stages of the procurement process including search, sourcing, negotiation, ordering, receipt, and post-purchase review (Croom & Brandon-Jones, 2004). One can therefore stick a neck to say e-Procurement is a means that enables procurement activities such as sourcing, ordering, commissioning, receipting and providing payments for works, goods and services.

E-Procurement lends itself to collaborative arrangements. Combining the purchasing power of organisations is likely to enhance the benefits from a reduction in the cost of goods and services and implementation costs.

1.2 PROBLEM STATEMENT

This world we live in is becoming a global village both literally and figuratively via the use and aid of modern Information Communication Technology (ICT). Just as governments and corporate entities are starting to think sustainably so should the whole construction industry in order for a more holistic developmental agenda of our dear country Ghana. Ghana like most African countries is striving to catch up with the needs of its citizens and their infrastructural development, all European and most developed countries in terms of infrastructural needs are all going towards sustainability. If Ghana as a recently acclaimed middle income status should start thinking and implementing policies that aim at achieving total sustainability. What and appropriate way for construction firm to contribute their quota then to also take the opportunity through procurement sustainably.

1.3 AIM OF THE RESEARCH

The aim of this study is to find out the acceptance of e-procurement on the local construction industry in Ghana.

1.4 RESEARCH OBJECTIVES

This research work will seek to achieve the following objectives:

- To identify factors leading to the acceptance of e-procurement in Ghana
- To find out the challenges associated with the acceptance of e-procurement in Ghana.

1.5 RESEARCH QUESTIONS

- What is the level of acceptance of electronic or e- procurement on the Ghanaian construction industry?
- What factors go into the implementation of e-procurement?
- Are there benefits derived through e-procurement by contracting firms?
- What are the challenges of e- procurement in Ghana?

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1.6 JUSTIFICATION OF THE STUDY

This research work sort to find out the factors that influence the acceptance of e-procurement and the challenges that are associated with acceptance of e-procurement in the industry. The findings of the study will add to the already existing authentic facts in the area of electronic procurement. The results of this research and its recommendations will serve as a guide for further research on e-procurement and its potential in the Ghanaian construction industry.

1.7 SCOPE OF STUDY

This research work is primarily limited to finding out how far the local construction industry have accepted e- procurement method of procuring among the players in Greater Accra region. It is therefore limited to procuring activities by the construction industry key personal in the Greater Accra Region. This region is selected primarily because majority of the industries big players in the construction sector are more polarised to study as a true representation. The study was mainly on the Construction Industry in Ghana (CIG) and included selected key personal who

are currently considered as the industry's procuring personnel. The stakeholders (Consultant, Contractor and Client) were administered with structured questionnaires.

1.8 ORGANISATION OF THE STUDY

This research work covers five main chapters. Mainly:

The first chapter gives a general introduction of the study looking at the problem statement, research questions, objectives, justification, and scope of the study, methodology and limitations to the study

Chapter two reviews the literature on the study area. This contains a desk study of relevant information related to the topic under study.

Chapter three focuses on data collection and data presentation on how well the selected schools meet standard requirements of providing access for the disabled.

Chapter four deals with the analysis of data as presented in chapter three. Here presentation of findings was complimented with the appropriate pictures where necessary.

The final chapter contains the summary, recommendations and conclusion of the whole study.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews works done on Public procurement theoretically in relation to electronic procurement. This review focuses on the overview of electronic procurement in Ghanaian construction industry. A comprehensive method was needed for the literature review aspects of this kind of research. The literature review began with a detailed search for publications on the subject of “Electronic procurement”.

The Public Entities, who are major stakeholders of the reform, have expressed varied perceptions about the implementation of the electronic procurement. The Public Procurement Authority (PPA) has also given some responses to some of the key issues raised by the public and the entities. In this chapter, a number of relevant literatures on the acceptance of public procurement in relation with e-procuring in Ghana are presented in order to establish and provide answers to the research question.

It was decided to conduct an initial search using “Electronic procurement” as the main keyword. Thereafter a further search was conducted through the internet and references of publications to identify other seminal publications and developments in the field. This helped to identify and examine 60 plus publications. The reason for opting for Scopus and Wikipedia are that they offer the world’s largest abstract and citation database of peer-reviewed literature.

2.2 PUBLIC PROCUREMENT OVERVIEW

Public procurement dates far back into history between the early ages of 2400 and 2800 B.C. (Thai, 2001), with a procurement order of containers of oil numbering in fifty (50) (Coe, 1989). Historical evidence of procurement activities was the development of the silk trade that involved some Asian countries such as the Chinese Dynasty, the Byzantine kingdom and its European counterparts such Roman empire, Greek, and even the Turkish kingdoms in 800 B.C. (Thai, 2001). The significance of public procurement cannot be overemphasized considering the huge financial commitment that is usually involved in the procurement process.

The estimated annual value of public procurement for goods, works, and consultancy services at 600 million US dollars representing about 10% of the country's GDP according to reports released by the World Bank in 2003. Public procurement can therefore be said to be an integral function of governments in both developed and developing countries as the gigantic financial outflows has a great impact on their economies that needs prudent management (Thai, 2001). Participatory sureties and players in this sector through prudent handling of public procurement functions is fundamental to achieving economic, socio-political and other objectives of government and private entities as a whole.

The essential role of public procurement in economic and social development, the World Bank specifies four thematic areas of public procurement for its funded projects. That is, ensuring that there is fair competition among bidders, promoting transparency in awarding and execution of its contracts and finally, encouraging the development of indigenous contractors and suppliers (Thai, 2001; Tucker, 1998).

Furthermore, Schapper et. al (2006) are of the view that technology can be used to enhance transparency and accountability in procurement. Shadrach and Ekeanyanwu (2003) assert to the views by Schapper, et al (2006). These authors indicated that electronic commerce (e-commerce) can be used to enhance transparency in the procurement process through effective audit and monitoring of low value transactions. Accordingly, the instances of high value and very complex procurement procedures can make use of IT, key features of transparency involves publicly available information on procurement policies such as that of information dissemination on bidding programmes, standardized documentation, and bid evaluation of tender documents and declaration of tender results.

2.3 OVERVIEW OF GHANAIAN BUILDING CONSTRUCTION INDUSTRY

The construction industry according to Lange and Mills (1979) is conceptualized as any group of firms with closely related activities involved in the construction activities such as real estates, building, private and public infrastructure and its related consultancy services. This construction industry is unique and different to other industries, such as the manufacturing or retail sector, where processes and the working environment are well defined and controlled (Gann, 1996).

The industry is characterized by its uniqueness, on-site production and ad hoc project teams with high turnover rate with given input of resources. The industry relies on its usage of large amounts of resources such as capital and information in the execution of programmes. Construction organisations today are faced with many new challenges, including the need to change current work practices; become more

clients orientated; become more competitive; and become more productive (Love, 1996).

2.4 CONCEPT OF PUBLIC PROCUREMENT

According to Lyson, (1996) organizational procurement may be explained as that function responsible for obtaining by purchase, lease or other legal means, equipments, materials, supplies and services required by an undertaking for use in satisfying wants. The silver line within the definition is “to obtain materials, goods and services” at the right quality, in the right quantity from the right source delivered to the right place at the right time at the right price, to achieve an organizational objective and targeted goals.

In Ghana procurement, according to the Public Procurement Act, 2003 (Act 663), is ‘the acquisition of goods, works and services at the best possible total cost of ownership, in the right quantity and quality, at the right time, in the right place for the direct benefit or use of governments, corporations, or individuals, generally via a contract’ (PPA Module, 2007). In other words, Public Procurement is the process by which organizations acquire goods, works and services using public funds. It is a comprehensive process that runs from proper procurement planning, budget allocation, bids invitation, bids evaluation, award of contract, contract management, performance measurement, monitoring, auditing and reporting.

2.5 BACKGROUND TO E-PROCUREMENT

The beginnings of e-Procurement were in the early 1980s with the development of electronic data interchange (EDI). This allowed customers and suppliers, most often in the fast moving consumer goods business (FMCG), to send and receive orders and invoices via secure store and call forward networks. These EDI systems allowed businesses to exchange and synchronise master data files on products, prices, specifications and information about each other's locations and trading practices (CIPS 2013).

In the 1990's internet software started to become available, and software companies began to develop buyer managed electronic catalogues for use by vendors. Sometimes these proved to be too unwieldy due to failures in communication between customers and suppliers (salesman and buyers), and software companies started to customise, maintain and host some catalogues, effectively becoming "the intermediaries between the buyer hub and the vendor spokes" 1 and vice-versa. As the catalogues became outsourced, software companies started to offer the same catalogues to a number of buyers (CIPS, 2013). The impact of the internet on the business world has occurred with astonishing speed. In a handful of years the web has become a means of mass communication, a global sales channel, a platform for collaboration and a core feature of business strategy. The 'virtual organisation' which sheds assets and uses technology to bind together a dispersed network of suppliers, manufacturers and distributors has become a reality (Kraemer & Dedrick, 1994).

E-Procurement has changed the dynamics of the P&SM profession by, for example, placing a greater emphasis on knowledge management. It is suggested that e-Procurement will change the culture of P&SM in an organisation and may lead to a greater emphasis on cost and prices (CIPS, 2013).

2.6 NATURE OF E-PROCUREMENT SYSTEMS IN GHANA

According to the African Development Bank (2012) Sustainable public procurement is a tool which allows governments to leverage public spending between 15 to 25 % of GDP in order to promote the country's social, environmental and economic policies (UNEP, 2012)

Procurement processes and procedures in Ghana have gone through a number of changes, with the main objective of reducing or at best eliminating corruption in public procurement, realizing value for money, efficiency in the procurement process among others. A major change was the passing of the Procurement Act, Act 663, in 2003. It is sincerely clear that Act 663 as introduced established high level of sanity in the procurement environment, it's entirely manual base has led to some procurement practitioners calling for the establishment of e-Procurement in the country (PPA Module, 2007).

E-Procurement is defined as a comprehensive process in which governments use IT systems (including the Inter-net) to establish agreements for the acquisition of products or services. The Internet's rapid growth has driven many governments to add an electronic commerce component to their operations to gain competitive advantage.

Ghana is currently implementing the e-Ghana project to enhance the use of technology in government's dealings with the public. It is therefore imperative that e-Procurement is adopted as one of the applications of the e-Ghana project to ensure increased.

2.7 SUSTAINABLE PUBLIC PROCUREMENT

The global population is increasing and consumption rates per capita are growing. Human consumption of resources significantly exceeds what the earth can provide. Sustainable public procurement (SPP) has emerged as a powerful way to stimulate more sustainable consumption and production patterns for society at large. This brief examines the reasons behind the current drive towards sustainable public procurement, and the barriers that have to be overcome in order to implement it (UN, 2007).

Sustainable procurement is defined as: "A process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, whilst minimising damage to the environment" (UNEP, 2012).

As governments across the world work towards increasing efficiency and transparency in their procedures and processes, procurement is being decentralized across national, regional and local government hierarchies. This gives individual departments and local governments the desired flexibility to decide how their budgets are spent and hence, increases opportunities to enlighten procurers and

policy-makers to integrate environmental and social elements into the procurement process. However, decentralization makes it difficult to assign responsibility in terms of rolling out a national sustainable procurement action plan and integrate elements of sustainability into established procurement processes. As the national programme in the U.K. aptly demonstrates, key government offices and organizations need to be entrusted with the responsibility of making sustainable procurement a reality. Decentralization also means that a large number of procurers are being empowered to make decisions on procurement. This makes a case for national policies and plans on SPP, which provides the much needed legitimacy, framework and direction for SPP to be rolled out across the public sector in a systematic manner. (IISD, 2007).

Taking a bystander look into public procurement in Ghana reveals little inclusion of sustainable necessary clauses in the PPA act to cater for the overwhelming activities that come with procurement in the sector whereas the European policies, in particular the procurement directives that have required the renewal of national procurement laws, and communications by the European Commission, such as the one on integrated production policy that encourages Member States to develop (Reindard et al, 2007).

2.8 NATURE OF PUBLIC E-PROCUREMENT SYSTEMS

The increased adoption of the internet for business uses globally, has influenced the function of procurement to migrate from traditional paper-based processes to e-procurement. The unique features of the internet and related web-based technologies can potentially support the activities of procurement, and at the same time provide improvements to the procurement process. It is on this ground that e-procurement

has, in recent years, been used as a means to significantly reduce costs because its ability to reduce transaction costs and manage the inventory in a more efficient manner. In its most basic definition, e-procurement is the streamlining of procurement/purchasing processes by eliminating traditional paper-based documents such as purchase orders, requisitions forms, invoices etc and replacing them with electronic based paperless processes. It is a powerful business tool that can revolutionize the buying function of an organization by streamlining and automating the labour intensive procurement routines which in return enable employees to gain direct access to their suppliers' systems, visually confirm technical specifications and view product pictures, price points, and detailed product descriptions, (Thompson et al, 2008) According to Koorn et al (2001), there are three types of e-Procurement Systems: Buyer e-Procurement Systems, Seller e-Procurement Systems and Online Intermediaries. Thus the system could be for Buyers, Sellers and Intermediaries. Companies that use e-procurement technologies save 42% in purchasing transaction costs due to the simplification in the purchase process and the reduction in purchasing cycle time, which in turn, increases flexibility and provides more up-to-date information at the time of placing a purchase order. Thus, e-procurement tends to leverage the bargaining power of companies willing to establish contracts with their preferred suppliers and as a result, the overall maverick buying is lower (Hawking et al, 2004). According to Turban et al (2000) many companies and government institutions across the globe are adopting e-procurement primarily to save costs of operations as procurement consumes up to 75% of the budgetary spending. However, apart from saving costs, e-procurement provides more benefits to the organisation or government institutions such as reduced purchasing cycle time, reduced inventory levels and costs, obtaining high quality data on purchasing

activities, enhanced transparency and accountability in the purchasing process, enhanced budgetary control and low prices due to product standardisation and consolidation of buys.

2.9 TYPES OF E-PROCUREMENT

There are different forms of technologies that are appropriate for different procurement activities; there are basically six forms of e-procurement classified (De Boer et al., 2002):

2.9.1. E-Ordering/E-Maintenance Repair Operate (MRO):

Electronic catalogue-based procurement (e-Ordering) provides electronic access to product catalogues, using Internet technologies, allowing users to search for an item across one or multiple catalogues and to raise a requisition or order for the items selected. Similar to Web-based ERP, but goods and services ordered are non-product-related MRO supplies. There is no legal constraint on the use of electronic catalogues that are controlled by the awarding authority and used as a tool to assist in the drawdown of items from a contract that has been put in place between that awarding authority and a supplier (PWC Bulletin, 2001).

2.9.2. Web-Based Enterprise Resource Planning (ERP):

Enterprise Resource Planning is a system for business management, encompassing modules supporting functional areas such as planning, manufacturing, sales and e-

business (Rashid et al, 2002). Creating and approving purchasing requisitions and placing purchase orders and receiving goods and services by using a software system based on Internet technology. Web-based Enterprise Resource Planning (ERP) procurement modules create and approve purchasing requisitions, place purchase orders and record the goods and services receipt using a software system based on Internet technology.

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2.9.3. E-Sourcing

Strategic sourcing is a systematic process for reducing the total cost of externally purchased goods or services, at a defined quality level. E-Sourcing is the automation of this process. It allows identifying new suppliers for a specific category of purchasing requirements using internet technology across spatial boundaries.

2.9.4. E-Tendering

Boulmakoul and Salle (2002) pointed out that electronic contract negotiation and other e-trading mechanisms must inherently provide some security properties to protect the legal elements of the process. Angelov and Grefen (2002) have reviewed frameworks for Business-to-Business Electronic Contracting Support. These studies have not directly addressed security issues unique to e-tendering.

Tendering is considered to be one of the fairest means of awarding government contracts and the method most likely to secure a favourable outcome for a government in its spending of public money. The basic principles of the tendering process have been applied to many business areas, such as purchasing goods, seeking service providers, business consulting, or the selection of main contractors for

construction work. Although demand from governments and the construction industry for paperless business processes has generated many commercial e-tendering systems around the world these remain largely untested from both a legal and security compliance perspective.

2.9.5. E-Reverse Auctioning/E-Auctioning

In a typical auction, a seller puts up an item for sale, multiple buyers bid for the item and the highest bidder will buy the goods at a price determined by the bidding. In a reverse auction a buyer issues a request for quotations to purchase a particular item. Multiple suppliers quote the price at which they are willing to supply the requested item or service.

2.9.6. E-Informing

E-informing is a form of EP that is not directly associated with a contract or a transaction, whereas the others are. E-informing is the process of gathering and distributing purchasing information both from and to internal and external parties, using Internet technology. For example, publishing purchasing management information on an extranet that can be accessed by internal clients and suppliers is a way of e-informing (Luitzen et al, 2001).

2.10 PROGRESS TO ADOPTING E-PROCUREMENT IN GHANAIAN

PUBLIC PROCUREMENT

The adoption of e-Procurement in Ghana is a new phenomenon although some initiatives have already being undertaken by few private companies especially owned by foreign investors in large part. Public procurement is still lagging behind as the initiatives slowly progressing and mostly things are done manually through following the traditional procurement. This calls for a total country approach where by the whole procurement system in the country will be integrated electronically.

E-Procurement in the public sector is internationally emerging. Countries such as Denmark, Norway, Finland, Ireland, the United Kingdom, Spain, Germany, Portugal, Italy, Singapore, Brazil and the regions in the USA and Australia have embarked on e-procurement (Ramanathan, 2004).

To start with, the country can start with the procurement of routine items which are less costly, risky and plenty available in the market as there are many suppliers. This will save costs, minimize unnecessary delays and ensure the achievement of value for money in public procurement. A case in point is Tanzania where they are trying to implement e-procurement and their efforts to integrate public procurement electronically Public Procurement Regulatory Authority (PPRA) has established the Procurement Management Information System (PMIS) for all public Procuring Entities (PEs) to share some data with PPRA for which its prudent for Ghana to learn from. PMIS is a tool to facilitate exchange of information between PPRA and PEs. It supports the system for checking and monitoring of procurement activities by enabling online submission of Annual Procurement Plans (APP), monthly reports and checklist forms (Sijaona, 2010). In November 2010 the PPA bulletin published a

total of 164 Procuring entities (PE) who submitted their plans for approval, online Procurement Planning System enables Public Entities to place or input their annual procurement plans online for the Authority and other supervisory bodies to monitor the ensuing procurement processes as mandated by law (Act 663) (PPA Module, 2007). The PPA is the supervisory bodies who are given access on the online Procurement Planning System. The Authority has also trained Public Entities on how to use the website in posting their tenders, contracts awarded; expression of interest, pre-qualifications as well as restricted tenders' contracts awarded. This posted information can be viewed by interested suppliers, contractors, consultants and the entire public who chose to visit the site. Published information is displayed on the site for a maximum period of three months. Through this, the PPA is currently redesigning the Public Procurement Model of Excellent (PPME) application, which is a tool for assessing the performance of procurement activities of Public Entities (PPA Module, 2007).

2.11 CHALLENGES TO ADOPTING E-PROCUREMENT IN GHANA PUBLIC PROCUREMENT

In the public procurement context, there are various organisational, technical and governmental challenges on the ground that defies the full integration and adoption of e-procurement in public procurement. Once these challenges are addressed effectively, the country will make good progress towards full application on e-procurement especially in public procurement. The challenges include but not limited to poor technological infrastructure, inadequate funds for capital investment, risks, unsupportive legal framework, shortage of technical know-how, incapable

suppliers, changes of responsibilities, shifting the mind-set of people. Also there is shortage of technical support, security of data transaction, poor network infrastructure and unstable power supply. The study found out that staffs are interested to operate electronically but currently they have made a little progress whereby they communicate with suppliers via e-mails, telephones and faxes thus, e-procurement is still at infancy stage. However, this is hindered by several challenges that include inadequate financial resources for capital investment, shortage of skilled manpower/experts in e-procurement and incapable suppliers.

The following are the prescribed key inhibitors to the adoption of e-procurement by developing countries such as Ghana by the World Bank in June 2006.

1. The complexities and risks of e-Procurement programme implementation are frequently misunderstood. Effective e-Procurement implies that changes occur across areas of personnel and executive behaviour, skills, regulations and legislation, operational policies, and business behaviour. Few, if any, of these changes will occur simply through the acquisition of some hardware and software, and if this is the understanding and intended starting point to e-Procurement then jurisdictions may find that the funds might better be spent on other priorities.
2. The full benefits resulting from e-Procurement adoption will only be realized through significant changes in the organization of public procurement operations and as such will require effective change management and excellent leadership bringing about collective commitment across government constituents and partnership with the business community. In the absence of such change management and leadership, the outcome may be at a net cost with technologies operating alongside or simply replicating traditional operational methods.

3. Rather than being a technological add-on to an already complex environment, e-Procurement needs to be understood as a tool to reform public procurement underpinned by an appropriate policy and legal framework, effective buyer and supplier activation including strong awareness and capacity building programs, technological infrastructure development, established standards, and sustainable operational e-Procurement applications.
4. Only if governments understand the potential benefits of e-Procurement and demonstrate professional leadership and political will in managing the e-Procurement program adoption as an integral part of reforming their public procurement systems, they will be able to tap the full potential of e-Procurement and move forward their development agenda on the basis of increased public procurement governance and performance standards.

2.12. E-PROCUREMENT INFRASTRUCTURE

Existing types of e-Procurement infrastructures can be summarised according to the EC (2010) as follow:

- E-Procurement platform: A solution designed specifically for an individual organisation to support its procurement processes. Due to the high development costs, such a system is commonly used by large organisations with a high number of procurement processes.
- Multi-organisation platform: A solution that a service provider develops and runs for subscribing procurement organisations.
- Central Purchasing Bodies'(CPBs) framework platform: A system supporting the provision of goods and services to public offices under framework

agreements signed by a CPB. Products and services covered by each framework contract are usually placed in a catalogue. By navigating such a database, individual public offices issue specific orders (by basically selecting how much they want to buy in the case of products and what type of tasks they want to be performed in the case of services). One example is the Austrian Federal Procurement Agency (FPA).

- Marketplace: A general catalogue of (common) products and services offered by a CPB to public buyers in a country or region. Interested suppliers subscribing to these services publish their products in the catalogue offered by the CPB specifying price, delivery time, areas served, guarantee period, etc. Procurers can navigate the catalogue, identifying for each item the suppliers offering that item and the related conditions and terms. They then choose the product by placing it into a "shopping cart".
- Procurement portal: A web based solution offering a single entry point to a number of procurement platforms such as those indicated above. The portal may provide some information on top of the services that it gives access to.

2.13 RELATIONSHIP BETWEEN SUSTAINABILITY AND E-PROCUREMENT

Correia et al (2013) argue that despite there being a strong drive by governments to push the SP agenda, there are no clear definitions on specific actions that will promote low carbon economies. They put forward that policies are often too broad and vague in terms of providing specific guidance on how SP is to be achieved and how low carbon emissions are to be accounted for. E-Procurement is the application

of technology to automate the exchange of procurement information throughout the supply chain. E-procurement has been identified as an instrument in public sector reform. It enables government to monitor the efficiency and effectiveness of procurement and provides more transparency and accountability.

2.14. PROCUREMENT PRINCIPLES AFFECTING COMPLIANCE TO E-PROCUREMENT

Public procurement is an information-intensive function of government. It has to satisfy requirements for goods, works, systems and services in a timely manner. Furthermore, it has to meet the basic principles of good governance: transparency, accountability and integrity (Wittig, 2003; Callender and Schapper, 2003).

2.14.1 Transparency, Competitiveness and Fairness in e- Procurement

An important issue in public sector management today is the increasing demand for transparency, efficiency and effectiveness in service quality (Ancarani, 2005). The advent of the Internet, digital connectivity, the explosion and use of e-commerce and e-business models in the private sector are pressuring the public sector to rethink hierarchical bureaucratic organizational models.

E-Government is defined as the use of technology, particularly the Internet, as a means to deliver services to citizens, businesses and other entities (Hart and Teeter, 2000; West, 2004). The common focus is on the application of ICT to improve the internal management of the government, to offer more flexible and convenient services to the public and to a limited extent, to enhance public participation and

democracy (West, 2004). Implementation of e-Government bring forth many advantages such as the reduction in paperwork, the provision of continuous service availability to customers, a reduction in response time and a reduction in error rate (West, 2004).

2.14.2 Value for Money in e- Procurement

Value for Money (VFM) is a concept that traditionally refers to the purchasing of the least-cost option. Green procurement extends this definition to include life cycle costs and all factors relevant to a particular purpose including the quality, resource use, fitness for purpose, timeliness, convenience and the ability of the product to enhance government's objectives (IISD, 2007).

This is an essential test against which procuring entities must justify a procurement outcome. Price alone is not a sound indicator and procuring entities cannot necessarily get the best value for money by accepting the lowest price or bid. Best value for money therefore means going beyond the price to get the best available outcome when all relevant costs and benefits over the procurement cycle are considered. It is therefore the responsibility of any set procurement structure like Internal Procurement Committees (IPC) to ensure that procurement proposals in the organisation reflect the best value for money and high quality possible. IPC as a structure that is sanctioned to ascertain the availability of funds to pay for procurements at the organisation should ensure that payments, as dictated by their thresholds, are commensurate with approved specifications, value and quality of goods, works or services. As such, attitudes of those who sit in IPC and procuring units must demonstrate the spirit of upholding value for money and cost effectiveness. VFM is hence used to assess whether or not government has obtained

the maximum benefit from the goods and services it acquires, within the resources available to it.

2.14.3 Efficiency in e- Procurement

The benefits of online technology for the efficiency and effectiveness of government procurement reflects on the cost of transactions and value-for-money outcomes. In addition to these outcomes e-Procurement can be expected to provide significant but less quantifiable benefits through greatly improved management information and analysis, laying the foundation for innovation in sourcing, aggregation and service production. In Ghana to be efficient and effective in Public Procurement is to carry out procurement activities in a professional and transparent environment with a clear set of predefined rules to foster enhanced competition thus stimulating efficiency and innovation amongst bidders. There is a better utilisation of funding, increased attractiveness to private sector and improved customer satisfaction (PPA, 2008). Efficiency in the public sector means satisfying the most essential needs of the community to the greatest possible extent using the limited resources that are available for this purpose. Thus, public entities should be represented by competent personnel capable of putting the Public Procurement Act (Act 663) into practice to attain efficiency and value for money.

2.14.4 Accountability in e- Procurement

Accountability is one of four core issues most often encountered in the work to strengthen capacities with national and local governments. Accountability “exists when rights holders and duty bearers both deliver on their obligations.” (UNDP 2008: 12).

Accountability constitutes a central pillar of any public procurement system. Without transparent and accountable systems enabling governments and citizens to engage in a mutually responsive way, the vast resources channelled through public procurement systems run the danger of increased corruption and misuse of funds. Even in a system with low levels of corruption, public and civic oversight can help identify inefficiencies, thereby increasing procurement efficiency and effectiveness for the benefit of improved service delivery and ultimately citizens.

2.14.6 Ethical Approach to e- Procurement

Ethics are the moral principles or values that guide officials in all aspects of their work. Ethical behaviour encompasses the concepts of honesty, integrity, probity, diligence, fairness, trust and respect. Ethical behaviour includes avoiding conflicts of interest, and not making improper use of an individual's position (Vera, 2006).

According to the CIPS bulletin 2013, Ethical procurement refers to procurement processes which respect fundamental international standards against criminal conduct and human rights abuse, and respond immediately to such matters where they were identified and result in progressive improvements to the lives of people who contribute to supply chains and are impacted by supply chain decisions.

2.15 CHALLENGES ASSOCIATED WITH ELECTRONIC PROCUREMENT

E-procurement implementations are also subject to challenges that can affect the further adoption or levels of diffusion. E-procurement gained popularity around the year 2000 with the emergence of the two competitors, companies that specialized in the support of electronic procurement for MRO products (Segev et al., 2000).

A study by Angeles and Nath (2007) identified three (3) main challenges to implementing e-procurement, these they highlighted as follows;

- lack of system integration and standardization issues
- immaturity of e-procurement-based market services and end user resistance
- maverick buying and difficulty in integrating e-procurement with other systems

2.15.1 Lack of System Integration and Software Immaturity

System specification appears to be a critical issue in the uptake of e-procurement. The IDC report (2003) highlights the slow uptake of e-procurement systems, emphasizing some of the IS-related issues that inhibit implementation, including software integration. Lack of system integration and standardization issues relates to the fact that e-procurement is still relatively new in Ghana and it is not unusual to find the total and complete lack of benchmarked reference model in the country (Angeles and Nath, 2007).

The extent to which an e-procurement system is able to integrate effectively with other information systems, particularly production planning & control and finance systems, is posited by Subramaniam & Shaw (2002) to be a major causal determinant of the efficiency and effectiveness of an e-procurement system. Rajkumar (2001) also identifies system integration as a critical success factor for e-procurement implementation, both with the customer's information infrastructure and in its links to suppliers.

Lin & Hsieh (2000) use a single case study to highlight the importance of both web content management and content rationalization as significant issues for e-

procurement operation. They note that constantly changing prices, specifications and account details across the supply base cause major problems in the maintenance of supplier catalogues. In addition, the way an item is described (item coding) is noted as a significant data management issue for e-procurement.

2.15.2 Immaturity of E-Procurement-Based Market Services and End User

Resistance

In some cases the immature service providers may not be able to provide a complete suite of services, especially for more complex or advanced e-procurement implementations projects. The immaturity of suppliers and the lack of preparation is also a challenge for many companies. After all, suppliers need to learn how to generate catalogues, process electronic purchase orders, how to use invoicing mechanisms among other tasks (Angeles & Nath, 2007). Including companies preferred suppliers is very important as according to Davila et al. (2003) the success of e-procurement solutions relies on the network effect that will be more effective if enough players are adopting the same technology. The other challenge here relates to the resistance of end-users towards operating the e-procurement solution. To prevent this Angeles and Nath (2007) state companies should encourage using new e-procurement technologies through intensive training and educational sessions with end-users.

2.15.3 Maverick Buying and Difficulty in Integrating E-Procurement with

Other Systems

Maverick Buying is the difficulty of changing purchasing-related behaviour among the entity's employees. Some companies find it difficult to eliminate maverick

buying even after the implementation of e-procurement. This can be prevented by intensive end-user training and educational programs. Companies also need to be aware of the problems in integrating the e-procurement solution with other systems (Angleles & Nath, 2007).

2.16 RISK ASSOCIATED WITH ADOPTING E-PROCUREMENT

Davila et al. (2003) identified four basic risk associated with the process to adopting e-procurement in any sector and these are relevant to the study in Ghana.

- Internal risk. Institutions have to be careful while integrating e-procurement technologies with their departments such as accounting, human resources, procurement unit, estate and administrative management. Globally public institutions that integrate e-procurement without taking the necessary internal audit check of their procurement system often have it impeded by employees who have not abreast themselves with this trend of technology (Davila et al.,2003).
- External business risk: e-procurement solutions also need to be able to cooperate with suppliers IT-infrastructure. For e-procurement solution to be successful suppliers must be accessible through the Internet and provide catalogues to satisfy the needs of their customers. In some cases suppliers might lack the resources to meet the demands of customers in catalogue developing and updating. Companies also need to develop mechanisms that provide the buyers with assurance that new suppliers meet the expectations and standards relating to supplier quality, service and delivery capabilities.

- Technology risks: Many companies are unsure which e-procurement solution best suits the specific needs of their company. The lack of widely accepted standards blocks the integration of different e-procurement solutions across the supply chain. The researchers insist that without widely accepted standards for coding, technical, and process specifications, adoption of e-procurement technologies will continue to be slow and will fail to deliver the promised benefits.
- E-procurement process risk; this risk relates to the security and control of the e-procurement process itself. Such issues can be related to data security, fraud and cyber crimes e.g. fake suppliers, fake bids and award.

2.17 THE CONCEPTUAL FRAMEWORK OF PROCUREMENT

This section presents the main conceptual framework which is the keystone for the study. The principal-agency theory is the underpinning theory used to establish the framework for this study. Eisenhardt (1988) had made contributions to the literature on principal agent theory. All these contributions have one main theme which is the relationship between a principal and an agent. The principal-agent theory concerns with the arrangement that exists when one person or entity (called the agent) acts on behalf of another (called the Principal). For example shareholders of a company (principals) elect management (agents) to act on their behalf, and investors (principals) choose fund managers (agents) to manage their assets. In this case the government of Ghana (Principal) engages PEs and PPA (agents) to undertake public procurement and enforcing the Public Procurement Act 2003 (Act 663) on its behalf.

With this relationship, the principal engages the agent who acts and makes decisions on behalf of the principal (Eisenhardt, 1989). This relationship works well when the agent is an expert at making the necessary decisions, but does not work well when the interests of the principal and agent differ substantially. In general, a contract is used to specify the terms of a principal – agent relationship.

The political system of any country such as Ghana can, of course, be understood as a complex network of principal-agent relationships composed of citizens, governments and their agents such as Ministries, Departments and Agencies, District Assemblies, elected officials, the judiciary, the legislature and the media. These actors concurrently play principal and agent roles within and across political organizations. The framework was developed in the context of examining the influences upon compliance with procurement directives (Gelderman et al., 2006) and, given its relatively general framing, provides a useful framework for examining the influences on the degree to which any aspect of public procurement policy translates into practice.

2.18 SUMMARY TO THE LITRATURE REVIEWED

This chapter has reviewed literature on the acceptance of e-procurement in the Ghanaian construction industry. The chapter in accordance with the set out goal with a well outlined set of objectives sort to find out the acceptance of e-procurement in the construction sector in Accra with a special focus of key stakeholders in the industry who currently take part in the procurement process in the industry. The reviewed literature has come up with the following outlined fact;

By reviewing the literature on e-procurement acceptance in the sector, it was found that most of the studies are discussing about the impact of e-procurement systems on

organizational performance. But fewer studies have been done on the individual and organizational factors that will affect the adoption of e-procurement system by the employees. In this study, we discuss about the individual and organizational factors that influence the employee's adoption of e-procurement system in the construction industry with key stakeholders.

Interestingly Government spends 600 million US dollars representing about 10% of the country's GDP according to reports released by the World Bank in 2003. Public procurement can therefore be said to be an integral function of governments in both developed and developing countries as the gigantic financial outflows has a great impact on their economies that needs prudent management (Thai, 2001). Participatory sureties and players in this sector through prudent handling of public procurement functions is fundamental to achieving economic, socio-political and other objectives of government and private entities as a whole.

The adoption of e-Procurement in Ghana is a new phenomenon although some initiatives have already being undertaken by few private companies especially owned by foreign investors in large part. Public procurement is still lagging behind as the initiatives slowly progressing and mostly things are done manually through following the traditional procurement. This calls for a total country approach where by the whole procurement system in the country will be integrated electronically.

Several challenges were identified in the adoption phase of e-procurement and these challenges include but not limited to poor technological infrastructure, inadequate funds for capital investment, risks, unsupportive legal framework, shortage of technical know-how, incapable suppliers, changes of responsibilities, shifting the mind-set of people. Also there is shortage of technical support, security of data transaction, poor network infrastructure and unstable power supply.

CHAPTER THREE

METHODOLOGY

3.1 RESEARCH DESIGN

This chapter describes the procedures that were used in this study for achieving the set objectives. How relevant data was obtained is contained in this chapter. The research procedure, sampling method used and size of population, questionnaire structure and distribution and data collection methods are discussed. The methodology used in this chapter included decisions on the type of data, techniques of data collection and the tools of data analysis to meet the objectives of the study.

3.2 RESEARCH PROCEDURE

The procedure for this research was done in two parts; the first part being an extensive hands on desk literature search on existing work on this new but not so alienated procurement type being e-procurement and how well the adoption process has been streamlined in other sectors and countries at large coupled with its associated challenges and the second part being a survey using postal questionnaire as an approach, augmented with informal interviews. The information gathered is then analyzed using statistical techniques.

1. Literature search at libraries and on the internet from journals, magazines, publications, research thesis and relevant textbooks on contractor selection.
2. Questionnaire survey highlighting the various segments covered in the objectives to achieve a common aim to this study.
3. Analysis of questionnaire using statistical techniques.

3.3 TYPE OF RESEARCH

The researcher adopted both a qualitative and a quantitative study, to establish the relationships which exist in accepting e-procurement in the Ghanaian construction industry

3.4 SAMPLING PROCEDURE

A convenient sampling was used for this study. It was formulated in such a manner that organizations and professionals with accumulated experience in the construction industry were chosen for the study. In terms of sampling, accessibility and data availability were the main reasons for selecting the sampled respondents for the study

3.5 SAMPLING FRAME

3.5.1 Study Area

A well structured questionnaire was administered to the various key stakeholders of the Construction Industry in Ghana (CIG). The following categories of people were administered with questionnaires and where deemed necessary interviewed:

3.5.2 The Construction Personnel Set up

- Procurement Managers – they are responsible for the purchasing of materials and equipment necessary for carrying out the works and scheduling delivery to Site in accordance to the Programme of works.

- Project Managers – they are responsibility for managing the entire project and the related risks that come along with it.
- Site Engineers - they are responsible for interpretation of architectural and engineering designs and propose alternative engineering solution with the approval of the Consultant and ensure compliance to Design Specifications
- Quantity Surveyors – they are responsible for ensuring that works are carried out within the stipulated budget and in the right quality before payments are made.

3.6 SAMPLE SIZE

The questionnaire were developed and structured to be able to achieve the objectives of the study. One hundred and eleven (111) questionnaires were prepared and administered from the above identified stakeholders. 92% of the questionnaires were filled and returned that is equal to one hundred and two (102) respondents which formed the sample size for the discussions and analyses.

3.6.1 Determination of Sample

The sample size of each entity population was determined statistically (Kish, 1965)

The sample size was determined using the formula:

$$n = \frac{n^1}{(1 + n^1/N)}, \text{ (Kish, 1965)}$$

Where n = sample size

$$n^1 = s^2 / v^2$$

N = total population

$v = \text{the standard error of sampling distribution} = 0.05$

$$V^2 = (0.05)(0.05) = 0.0025$$

$s = \text{the maximum standard deviation in the population element (total error of 0.05 at a confidence level of 95\%)}$

$$s^2 = P(1 - P) = (0.5) * (1 - 0.5) = 0.25$$

$P = \text{proportion of population elements that belong to the defined class}$

Calculating 95% confidence limit for the proportion of the population elements that belong to the defined category; $1 - \alpha = 0.95 \Rightarrow \alpha = 0.05$ i.e. $Z_{\alpha/2} = 1.96$

Standard error $Se = 0.05$

95% confidence limit:

$$\begin{aligned} P \pm Z_{\alpha/2} Se &= 0.5 \pm 1.96 (0.05) \\ &= 0.5 \pm 0.098 \end{aligned}$$

The 95% confidence interval will be from $(0.5 - 0.098)$ to $(0.5 + 0.098) = 0.402$ to 0.598 . Rounding to two (2) decimal places gives 0.40 to 0.60

This means that there is a 95% probability that the proportion of the population chosen for the study is between (40 to 60) % within a total error of 0.098

With the large sampling error, a larger sample should be used. Allowing for possible low response rate, a response rate of 45% is assumed.

Response rate, 45% = n/K , where K is the total number of questionnaires for each sample.

Substituting 100 into the Kish formula, a sample size of 50 is obtained. Substituting

$$n = 50 \text{ in } 45\% = n/K.$$

$$45\% = 50/K$$

$$K = 50/0.45 = 111$$

A total of 111 questionnaires sent to various firms relating to construction in the Greater Accra Region. Therefore 111 questionnaires were sent out for the firms.

3.7 SAMPLING

Questionnaires totalling 111 were sent to selected Architectural firms, Construction firms and Engineering firms involved in construction in Ghana based in the Greater Accra region.

3.8 PROCEDURE FOR DATA COLLECTION

Respondents were given four (4) days to answer the questionnaires and return the filled questionnaires. After the fourth day all non-respondents were contacted on phone and asked to return their completed questionnaire. All personal interviews were recorded using notebooks which supplemented the information from the questionnaire.

3.9 METHOD OF DATA ANALYSIS

The method adopted for presentation of findings from the field is frequency distribution table, bar chart and pie charts which enabled meaningful inferences from the field data to set the basis for discussions.

3.10 INSTRUMENTS FOR DATA COLLECTION

3.10.1 Questionnaire Structure

The structured questionnaire is attached to the appendix.. The questionnaire was tested within a small section of professionals in the construction industry for clarity, ease of use, and value of the information that could be gathered. The structure of the questionnaire and format of the interviews was broken down into the following major sections:

Section A: Personal / Company's Details

Section B: Factors Driving the Adoption of E-Procurement

Section C: Factors Inhibiting the Adoption of E-Procurement Initiatives

Section D: Benefits of E-Procurement Initiatives

Section E: Challenges to E-Procurement Initiatives

3.10.2 Interview Participation

The convenience sampling of interviewees provided for the study a cross-section of organizations and individuals typically involved with construction. The responses garnered supplemented the results gathered from the questionnaires. Responses to the interviews have been used to identify consistent themes, common practices, and insight provided by active and influential project participants that provided additional guidance and assistance to the researcher for the study.

The interviewers were encouraged to ask additional questions that focused on issues arising during the course of the structured interview.

3.11 DEVELOPING THE QUESTIONNAIRE

The questionnaire were developed and structured to be able to achieve the objectives of the study. The questions were designed to find the experience of the professional related to direct procurement. Respondents were asked to rank the various adoptions challenges and to formalise ratings that led to adoption of electronic procurement in the Ghanaian construction industry.

3.12 DISTRIBUTION OF THE QUESTIONNAIRE

Most of the questionnaires were administered face to face and some were addressed and e-mailed to the respondents using their parent companies web portals,. Key stakeholders such questionnaires were personally distributed. A small percentage 3.5% making (3) questionnaires were sent out via post self addressed and stamped envelopes were added to encourage high response rate. Very low response was experienced in 4 weeks of collection from the contractors. Phone calls were made for the location of firms and further personal distribution and collection of questionnaires to contractors was done.

3.13 SUMMARY

This chapter has established how questionnaires were developed, distributed and collected. Again, the chapter has presented how the sample was selected and the establishment of the sample size. Finally, the tools for analyzing the data were also identified. The next stage is to analyse and discuss the results obtained.

CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.1 INTRODUCTION

This chapter presents survey results and analyses data collected through administration of the questionnaires and further semi-structured interviews, observations, discussions and telephone conversations conducted with respondents. In using the research instruments, attempts were made to determine correlations that existed among variables. The chapter is structured into five sections. The various sections are outlined below tailor-made to achieve the set out objectives;

Section A. Personal / Company's Details

Section B: Factors Driving the Adoption of E-Procurement

Section C: Factors Inhibiting the Adoption of E-Procurement Initiatives

Section D: Benefits of E-Procurement Initiatives

Section E: Challenges to E-Procurement Initiatives

4.2 THE DEMOGRAPHY OF PERSONNEL

For the purpose of this analysis; Procurement Officers, Project managers, Consultants and Quantity Surveyors made up the total respondents for this study. Respondents under the general information in the questionnaire were classified as whether they work with Architectural firms, Engineering Firms, Construction Firms or Consultancy Firms.

Tables 4.1 and 4.2 below show the firms respondents belong to and their positions.

Table 4.1 shows the respondents firms while Table 4.2 relates to the number of

respondents per the firms contacted; out of 102 valid returned respondents, 35 Procurement professionals representing 100% responses were attained, 23 Project managers representing 92% responses received, 11 representing 73.33% for Consultants responsive output while 33 answered questions by Quantity surveyors representing 94.29 %.

VARIABLES (firms)	FREQUENCY	PERCENTAGE (%)
Architectural	9	8.82
Engineering	7	6.86
Construction	64	62.75
Consultancy	22	21.57
TOTAL	102	100.00

Table 4.1: Number of Questionnaires Issued, Returned and Percentage Returned

Source: Researcher's Fieldwork data, September 2014

A total of 111 questionnaires were distributed to various individual who are actively and directly linked to the construction industry in terms of procurement. The valid questionnaires received for this analysis were 102 from various professionals contacted.

On the whole, a total of 111 questionnaires, were distributed and 102 were returned, properly filled. That gives a response percentage of 91.49%.

PROFESSIONALS	NUMBER ADMINISTERED	NUMBER RETURNED	% RETURNED
Procurement officers	35	35	100.00
Project manager	25	23	92.00
Consultants	15	11	73.33
Quantity Surveyors	35	33	94.29
TOTAL	110	102	92.73

Table 4.2: Number of Questionnaires Issued, Returned and Percentage Returned

Source: Researcher's Fieldwork data, September 2014

These professionals were chosen because they currently the forefront procurement professionals easily identified to be directly involved in procurement in the construction industry in Ghana. Another key function of these professionals is project supervision and also they possess the skills to take part in the procurement activities in the construction industry.

4.3 QUALIFICATIONS AND EXPERIENCE OF RESPONDENTS

Table 4.3 shows that 10.78% of the respondents had Masters Degree, 42.16% had first degrees, 25.49 had HND and 21.57% had Technician certifications from recognised universities, polytechnics and other accredited tertiary institution.

QUALIFICATION	FREQUENCY	PERCENTAGE
MSc	11	10.78
BSc	43	42.16
HND	26	25.49
Technician	22	21.57
Total	102	100.00
INDUSTRY EXPERIENCE		
Years in Construction Industry	FREQUENCY	PERCENTAGE
15 years +	5	4.90
11 - 15 years	18	17.65
6 - 10 years	70	68.63
1 - 5 years	9	8.82
Total	102	100.00

EXPERIENCE IN PRACTICE		
Years in Procurement practice	FREQUENCY	PERCENTAGE
less than 5 years	14	13.73
6- 10 years	66	64.71
11 - 15 years	18	17.65
more than 15 years	4	3.92
Total	102	100

Table 4.3 Respondents Qualification and Experience

Source: Researcher's Fieldwork data, September 2014

In terms of education, respondents of the study area were very literate as shown in Table 4.3; the qualification ranges from Technician (CTC I, II and III), Higher National Diploma, Bachelor's Degrees to Masters Degrees. 21.57 % for Technician (CTC I, II and III), 25.49% had HNDs, 42.16% had BSc and 10.78% Masters Degrees all from recognized and well accredited tertiary institutions. This level of literacy enhanced the research, especially during the data collection because most of the respondents understood the issues related to electronic procurement. In fig 4.1 below shows the relationship that exist between the respondents and the number of years they practiced procurement. This showed that the respondents were experienced individuals and were adequate to help achieve the set out objectives.

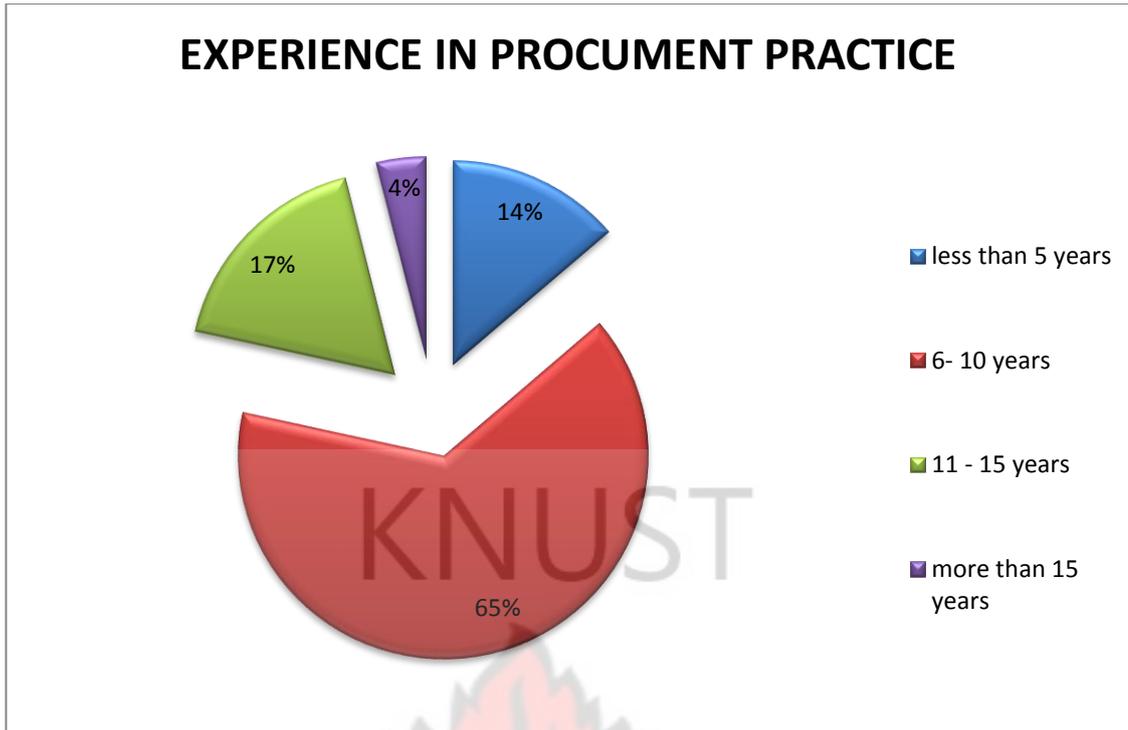


Figure 4.1: Experience of Respondents in relation to Procurement Practice

Source: Researcher's Fieldwork data, September 2014

4.4 STATE OF ELECTRONIC PROCUREMENT LITRACY

In order to achieve the set out objective of the literacy of electronic procurement to the sector in terms of information dissemination, the following results were derived from respondents on their views. Out of a total of 102 respondents, 92.17 % agreed to the timely dissemination of information on tendering advertisement through the usage of widely circulated news papers whiles 7.83% relied on the usage of noticed boards for tender adverts. Publication of contract awards in terms of information outflow; 97.04% of correspondents use newspapers to notify contracts awards while 2.96% use the noticed board. The above correlations led to 0% of respondents using the PPA's Bulletin and Radio stations to disseminate information on either tender advertisement or contract awards. Fig. 4.2 and Fig 4.3 denotes these findings

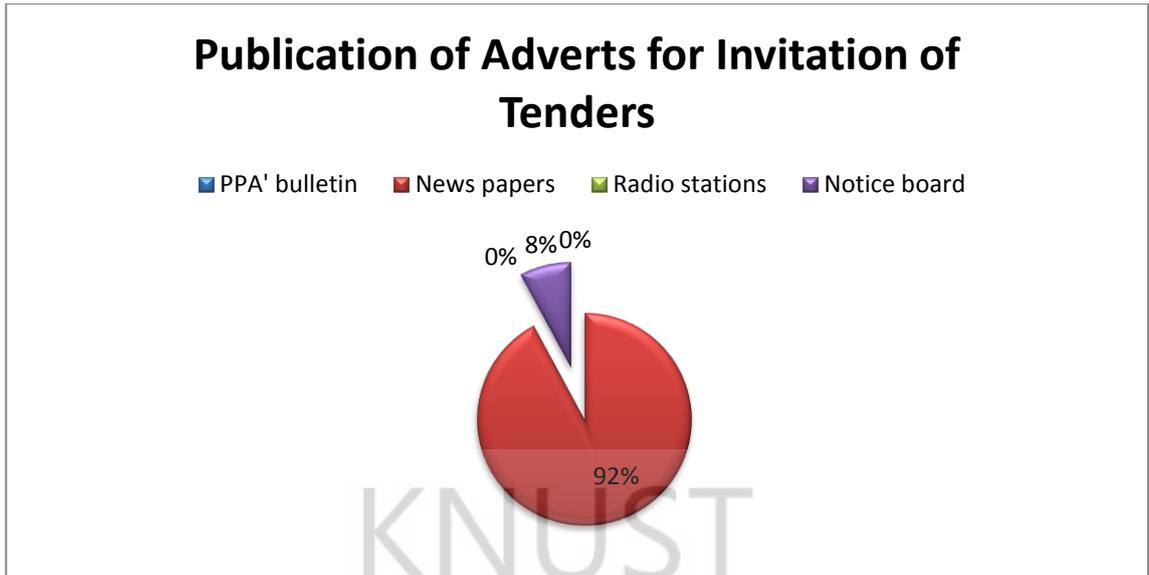


Figure 4.2: Publication of Adverts for Invitation of Tenders

Source: Researcher's Fieldwork data, September 2014

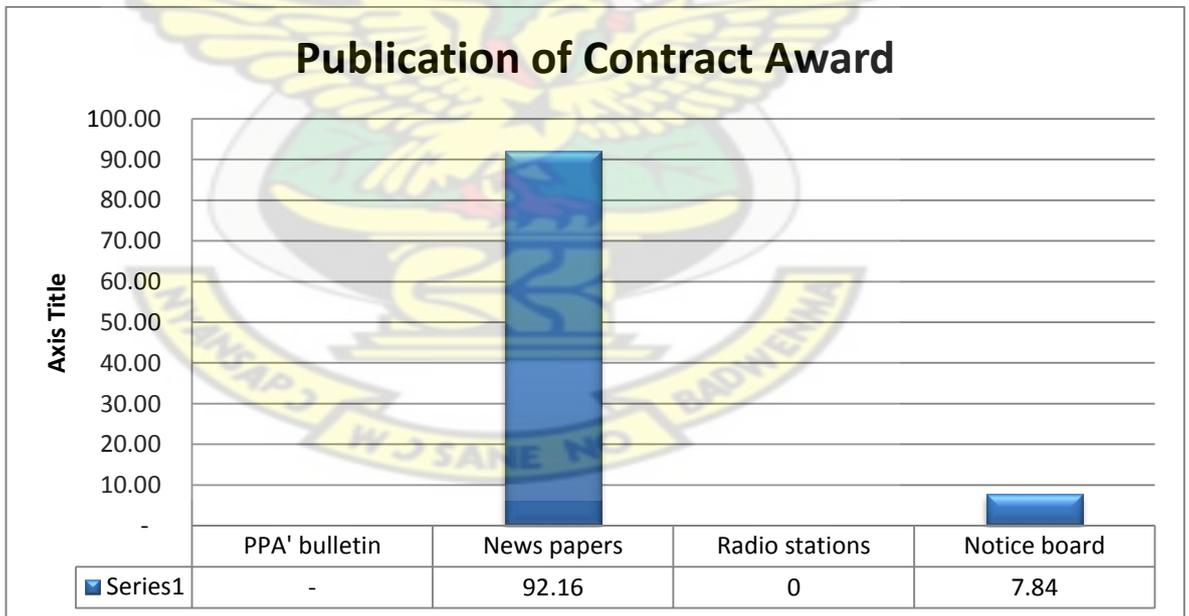


Figure 4.3 : Publication of Contract Award

Source: Researcher's Fieldwork data, September 2014

According to figure in Table 4.4, 85.29% of the respondents making a total number of 87 individuals provided various internet sites which are said to belong to their firm's while 15 individuals representing 14.71% of respondents ticked no to their firms having websites. From this information, out of the figures provided

FIRMS INTERNET WEBSITES		
	Frequency	Percentage
YES	87	85.29
NO	15	14.71
ONLINE PROCURMENT BY FIRMS		
YES	34	33.33
NO	68	66.67

Table 4.4 Online activities by firms

Source: Researcher's Fieldwork data, September 2014

4.5 FACTORS DRIVING THE ADOPTION OF E-PROCUREMENT

Survey respondents reported on the factors driving the adoption and of e-procurement in their organisations. The findings, set out in Table 4.5, indicate that more than 80% of respondents strongly agree or agree to the factors listed in the table to be the driving factors that is pushing for the adoption of e-procurement in their various places of practice, the factors driving adoption of e-procurement continue to emphasise productivity gains and cost savings.

Table 4.5 and Fig. 4.4 list and illustrate these driving factors and the respondents respond to the factors. The bar graph shows the relationship in terms of percentage of the distributions from Table 4.5.

ITEM	Factors Driving The Adoption Of E-Procurement	Likert scale	Strongly Agree	Agree	Disagree	Strongly Disagree
9	Reduce purchasing cost	Frequency	45	53	1	3
		% Distribution	44.12	51.96	0.98	2.94
10	Improve productivity	Frequency	15	78	9	0
		% Distribution	14.71	76.47	8.82	0.00
11	Improve efficiency	Frequency	18	78	6	0
		% Distribution	17.65	76.47	5.88	0.00
12	Improve effectiveness	Frequency	37	65	0	0
		% Distribution	36.27	63.73	0.00	0.00
13	Improve internal & external customer service	Frequency	25	77	0	0
		% Distribution	24.51	75.49	0.00	0.00
14	Standardise purchasing processes across the organisation	Frequency	33	64	5	0
		% Distribution	32.35	62.75	4.90	0.00

Table 4.5 Factors Driving the Adoption of E-Procurement

Source: Researcher's Fieldwork data, September 2014

From Table 4.5 and Fig 4.4 the following can be inferred: A significant percentage of about 90% plus of respondents either strongly agrees or agrees that the introduction of e-procurement will reduce purchasing cost, improve productivity, improve efficiency and effectiveness, improve internal and external customer service and standardise purchasing processes across the organisation. This is not too surprising since data analysed in chapter two seem to be supporting these findings to

which e-procurement when introduced will cut down on cost to firms and stakeholders in terms of sustainable procurement. Less than 5 % of respondents ticked disagree or strongly disagree and when compared to the over 95% of the respondents that sees the cost benefits of e-procurement. It was evidently clear that e-procurement's induction will reduce cost improve productivity as well as improve efficiency and effectiveness. It can be concluded that in the construction industry, the introduction of e-procurement will in the long term help the users to reduce cost.

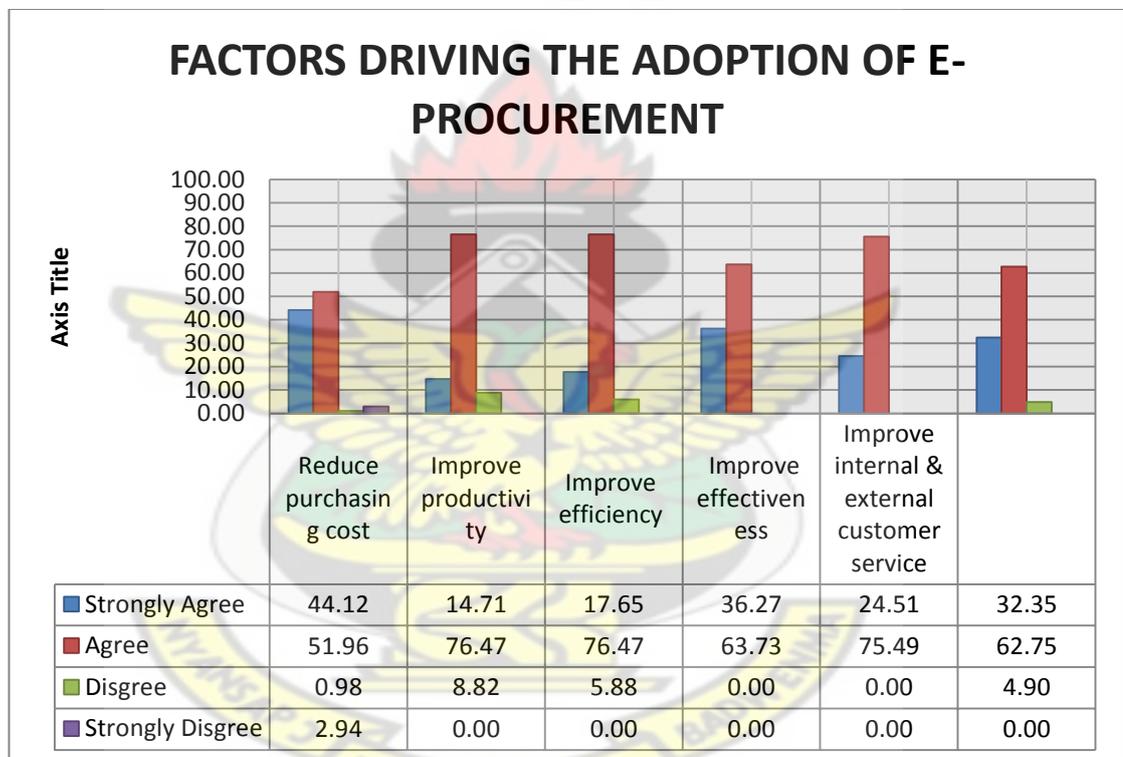


Figure 4.4 : Factors driving the adoption of e-procurement

Source: Researcher's Fieldwork data, September 2014

4.6 FACTORS INHIBITING THE ADOPTION OF E-PROCUREMENT INITIATIVES

Tables 4.6 and Fig 4.5 set out the seven (7) inhibitors that are creating major hurdles for adopting and/or implementing e-procurement in the Ghanaian construction industry. The groupings identify a similar set of inhibitors. The lack of supplier readiness coupled with e-procurement system integration issues and the remaining factors listed had respondents agreeing or strongly agreeing to these assertions, Out of the 102 respondents that took part in the survey study, a significant number of the populace gave an output of 34.17 % average for strongly agree, 59.24 % average for agree, 4.76 % average for disagree and 1.82% average for strongly agree to be the factors inhibiting the adoption of e-procurement in the construction sector. This suggests that as organisations evolve toward a more strategic view of e-procurement (see Table 4.6).

Question	Inhibiting Factors	Likert scale	Strongly Agree	Agree	Disagree	Strongly Disagree
15	Lack of supplier readiness	Percentage	33.33 %	60.78%	4.90%	0.98%
		Frequency	34	62	5	1
16	Systems integration issues	Percentage	45.10%	50.98%	3.92%	0.00%
		Frequency	46	52	4	0
17	Unable to justify costs/benefits	Percentage	39.22%	47.06%	11.76%	1.96%
		Frequency	40	48	12	2
18	Implementation costs	Percentage	17.65%	79.41%	2.94%	0.00%
		Frequency	18	81	3	0
19	Inadequate technological infrastructure	Percentage	53.92%	40.20%	5.88%	0.00%
		Frequency	55	41	6	0
20	Insufficient skilled staff	Percentage	22.55%	68.63%	1.96%	6.86%
		Frequency	23	70	2	7
21	Lack of management support	Percentage	27.45%	67.65%	1.96%	2.94%
		Frequency	28	69	2	3

Table 4.6 Factors inhibiting the adoption of e-procurement initiatives

Source: Researcher's Fieldwork data, September 2014

Finally, the inability to justify costs/benefits as an inhibitor for adoption focuses attention to broader considerations relating to benefits management and value creation in systems development in that benefits do not necessarily reside within the IT domain but incorporate changes in wider organisational activities; requiring changes to be identified and planned for and incorporate varying stakeholder expectations and roles (Tiernan & Peppard 2004; Dhillon 2005).

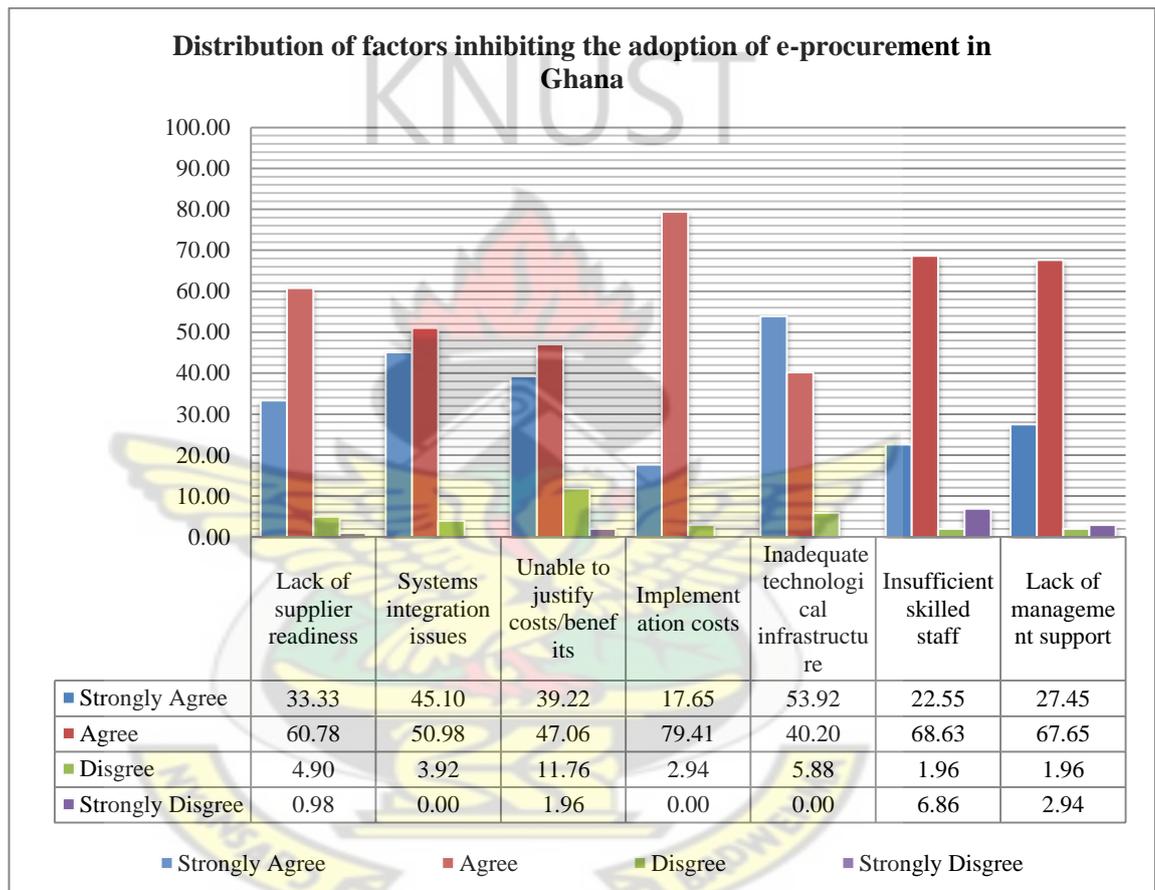


Figure 4.5: Distribution of factors inhibiting the adoption of e-procurement in Ghana Source: Researcher’s Fieldwork data, September 2014

4.7 BENEFITS OF E-PROCUREMENT INITIATIVES

Respondents in the study were asked to rate the benefits of e-procurement implementations to their organisations in the construction industry and they rated the following benefits and illustrated in Table 4.7 and Fig 4.6. The three (3) under listed benefits had the following responds given by the various stakeholders as respondents to the study into the benefits derived from adopting and implementing e-procurement in the construction industry.

QUESTION	BENEFITS OF E-PROCUREMENT	Likert scale	Strongly Agree	Agree	Disagree	Strongly Disagree
22	Improved supply chain integration	Distribution	39	58	5	0
		Percentage %	38.24	56.86	4.90	0.00
23	Reduced employee overhead	Distribution	47	34	18	3
		Percentage %	46.08	33.33	17.65	2.94
24	Improved supplier sourcing	Distribution	50	49	1	2
		Percentage %	49.02	48.04	0.98	1.96

Table 4.7 Derived Benefits of E-Procurement

Source: Researcher's Fieldwork data, September 2014

Interestingly, the respondents who seek to implement or had partial implemented e-procurement reported major or significant benefits in terms of improving their supply chain, reduce employee overheads and improved supplier sourcing for procurement. A significant percentage of 38.24% 46.08% and 49.02 % strongly agreed to the listed benefits of improved supply chain integration, reduced employee overhead and improved supplier sourcing respectively to the study, While a good percentage of 56.86%, 33.33% and 48.04% representing agreed to improved supply

chain integration, reduced employee overhead and improved supplier sourcing as key benefits. These two high percentages in the study shows that respondents strongly agree or agree to the benefits and therefore the industry when e-procurement is adopted will benefit from hugely. 4.90 %, 17.65% and 0.98 % represented improved supply chain integration, reduced employee overhead and improved supplier sourcing for the likert scale to disagree to the benefits of e-procurement. 0.0% of respondents strongly disagree to the benefit being improved supply chain integration, while 2.94% strongly disagree to reduced employee overhead as a benefit for the adoption of e-procurement, whereas 1.94% was recorded for strongly disagree improved supplier sourcing as a benefit to the introduction and adoption of e-procurement. In conclusion, it is clear that the adoption of e-procurement will bring good benefits to the construction industry in Ghana. The bar chart in Fig. 4.6 show the relationship of the distribution for the respondents to the study.

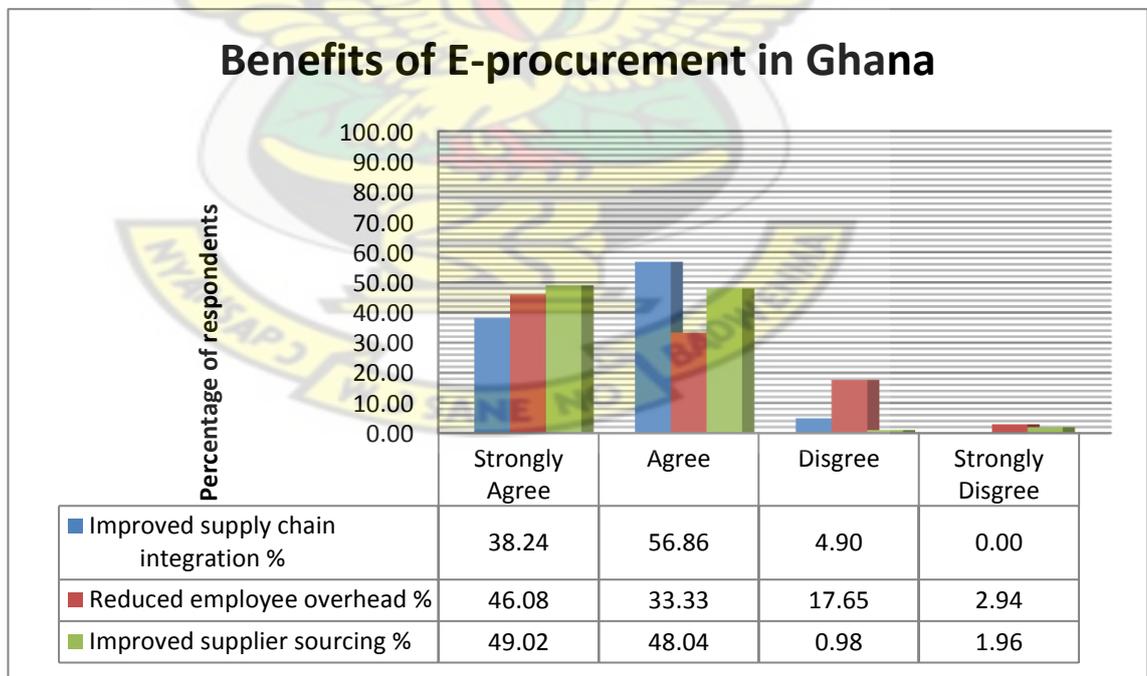


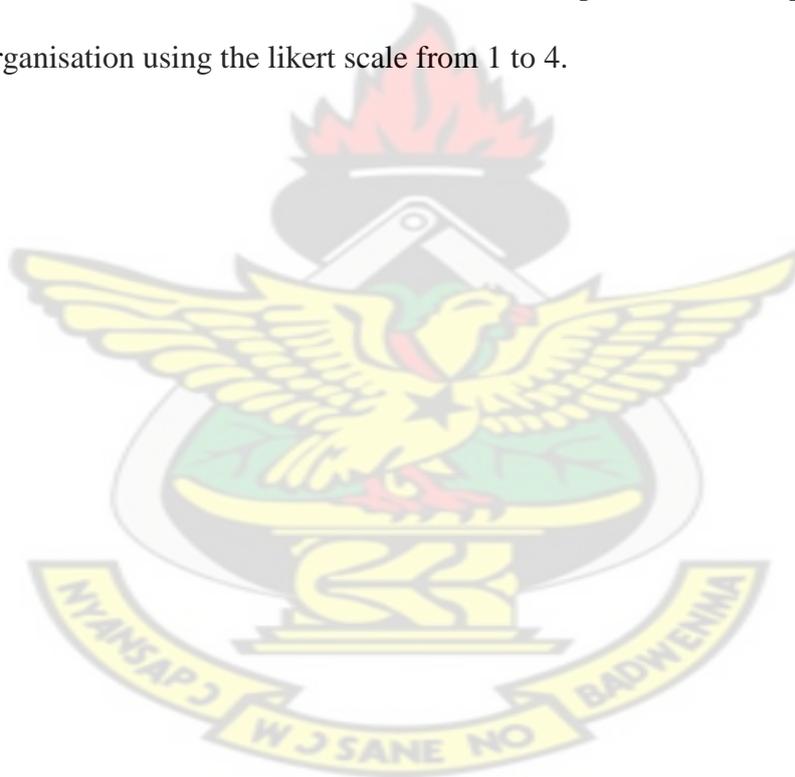
Figure: 4.6: Distribution of Benefits of E-procurement in Ghana

Source: Researcher’s Fieldwork data, September 2014

Although achieving cost and operating efficiencies are important, the main value added benefit of e-procurement may be derived from better information for strategic decisions and governance practices ,these are evident in the respondents turnout distributions of more than 80% either strongly agreeing or agreeing to the listed benefits to the sectors.

4.7 CHALLENGES TO E-PROCUREMENT INITIATIVES

Respondents were asked to rate the benefits of e-procurement implementations to their organisation using the likert scale from 1 to 4.



Question	Challenges to e-procurement initiatives	Frequency Distribution	Strongly Agree	Agree	Disagree	Strongly Disagree
25	Software integration issues	Distribution	18	78	2	4
		Percentage %	17.65	76.47	1.96	3.92
26	Difficulties with catalogue integration	Distribution	16	71	6	9
		Percentage %	15.69	69.61	5.88	8.82
27	Difficulty aligning organisational culture with e-procurement	Distribution	53	43	3	3
		Percentage %	51.96	42.16	2.94	2.94
28	Coordinating inter-organisational information	Distribution	38	47	16	1
		Percentage %	37.25	46.08	15.69	0.98
29	Assessing cost/benefits	Distribution	19	78	3	2
		Percentage %	18.63	76.47	2.94	1.96
30	Supplier readiness	Distribution	14	87	0	1
		Percentage %	13.73	85.29	0.00	0.98

Table 4.8 challenges to e-procurement in Ghana

Source: Researcher's Fieldwork data, September 2014

E-procurement implementations are subject to challenges that can affect the further adoption or levels of diffusion. Respondents were asked to identify the major challenges to e-procurement implementation; the six challenges are set out in Table 4.8. Issues relating to software 17.65% for strongly agree and 76.47% for agree while catalogue integration taking 15.69% and 69.61% for strongly agree and agree respectively now rank as two major challenges facing firms currently procuring online. These integration challenges are consistent with the increased reach of e-procurement implementation across the enterprise. Further, implementations are now

deeper in terms of functionality thereby impacting a greater range of business processes and associated procurement practices across organisational boundaries. These changes are creating challenges in aligning organisational culture with new e-procurement practices.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

The purpose of this chapter is to round off the research with summary of findings, conclusion and recommendations. The conclusions would be made from the analysis and the objectives of the research.

It further gives recommendations to improve the acceptance and address the impact of electronic procurement in the industry.

5.2 SUMMARY

This study probed into the acceptance of electronic procurement by the construction industry in Accra and to find out the challenges that come with the acceptance of electronic procurement in the industry. The study identified factors leading to the acceptance of e-procurement in Ghana, it also sort to find out the challenges associated with the acceptance of e-procurement in Ghana, A survey analysis method, distribution tables and figures were the statistical techniques used for the analysis of the data the study revealed the following:

- By reviewing the literature on e-procurement acceptance in the sector, it was found that most of the studies are discussed the impact of e-procurement systems on organizational performance. But fewer studies have been done on the individual and organizational factors that will affect the adoption of e-procurement system by the employees. In this study the individual and organizational factors that influence the employee's adoption of e-

procurement system in the construction industry with key stakeholders was the primary focus.

- Interestingly Government spends 600 million US dollars representing about 10% of the country's GDP on procuring goods, works and services according to reports released by the World Bank in 2003. Public procurement can therefore be said to be an integral function of governments in both developed and developing countries as the gigantic financial outflows has a great impact on their economies that needs prudent management (Thai, 2001). Participatory sureties and players in this sector through prudent handling of public procurement functions is fundamental to achieving economic, socio-political and other objectives of government and private entities as a whole.
- The adoption of e-Procurement in Ghana is a new phenomenon although some initiatives have already been undertaken by few private companies especially owned by foreign investors in large part. Public procurement is still lagging behind as the initiatives slowly progressing and mostly things are done manually through following the traditional procurement. This calls for a total country approach where by the whole procurement system in the country will be integrated electronically.
- Several challenges were identified in the adoption phase of e-procurement and these challenges include but not limited to poor technological infrastructure, inadequate funds for capital investment, risks, unsupportive legal framework, shortage of technical know-how, incapable suppliers, changes of responsibilities, shifting the mind-set of people. Also there is shortage of technical support, security of data transaction, poor network infrastructure and unstable power supply

5.2.1 Objective one: To identify factors leading to the acceptance of e-procurement

From the analysis made in chapter four (4) and the thorough review of literature in chapter two, the factors identified were grouped into two sets, the first being factors driving the adoption of e-procurement in the construction industry and these factors are;

- I. Reduce purchasing cost
- II. Improve productivity
- III. Improve efficiency
- IV. Improve effectiveness
- V. Improve internal & external customer service
- VI. Standardise purchasing processes across the organisation

The groups of factors that were identified in the reviews as well as in the analysis came up with factors inhibiting the adoption of e-procurement initiatives in the construction industry, these factors include;

- I. Lack of supplier readiness
- II. Systems integration issues
- III. Implementation costs
- IV. Inadequate technological infrastructure to support e-procurement
- V. Lack of management support
- VI. Unable to justify costs/benefits

5.1.2 Objective two: To find out the challenges associated with the acceptance of e-procurement in Ghana.

The study highlighted the challenges that are associated with the acceptance of electronic procurement in the construction industry. The analysis in chapter 4 coupled with a in-depth review of literature identified these challenges;

- I. Software integration issues relating to electronic procurement
- II. Difficulties with catalogue integration to electronic procurement
- III. Difficulty aligning organisational culture with e-procurement
- IV. Coordinating inter-organisational information
- V. Assessing cost/benefits of electronic procurement
- VI. Supplier readiness to implement electronic procurement

Improved procurement information is frequently claimed to be a perceived benefit in the research literature on e-procurement, however there are few empirical studies that investigate this acceptance phenomenon e-procurement in Ghana or establish the contribution of improved procurement information available to the Ghanaian construction industry.

5.3 CONCLUSION

It can be concluded that, the construction industry has always been a procuring industry in any economy, the value potential of e-procurement has significant implications for the construction industry. It is imperative for the industry to fully realize what drives the construction industry to adopt and exploit the benefits of e-procurement techniques.

The results from this study can provide the industry with a better understanding of factors associated with the adoption of e-procurement, which will be a useful reference for them to develop appropriate e-procurement strategies. Specifically, the results showed a trend of cost reduction, promotion of efficiency and the prime objective of every procurement system thus value for money.

The challenges, however, should be examined with caution. It appears that the industry consider the barriers of e-procurement adoption more of an inter-sectoral factor. This makes sense from a pragmatic point of view, because both the potential risk and the extent of information search and processing tend to be higher in these situations.

The implication of e-procurement solutions are provided with insights into the factors that are significantly associated with e-procurement adoption and challenges.

5.4 RECOMMENDATION

Following the findings and conclusion, the construction industry must begin to have a critical assessment into the prospects of electronic procurement practices, in or to for value for money.

The construction industry together with the stakeholders must equip themselves with several of physical infrastructure to enable them access basic electronic procurement applications.

The stakeholders in procurement should show support for innovation such as e-procurement must also show the right commitment to such innovations so that it would make the adoption much easier into the industry.

In order to facilitate the use of electronic procurement in the construction industry, the industry leaders must put in place the necessary laws such as National internet laws so as to enable them in the industry.

Finally future research could be carried out to assess the impact of e-procurement and its effects on the Ghanaian construction industry.



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APPENDIX 1

FACULTY OF ARCHITECTURE AND BUILDING TECHNOLOGY

COLLEGE OF ARCHITECTURE AND PLANNING

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY,

KUMASI

Topic: **THE ACCEPTANCE OF E-PROCUREMENT IN GHANA: A STUDY
OF KEY STAKEHOLDERS IN THE CONSTRUCTION INDUSTRY IN
GREATER ACCRA**

Target Group: Construction Industry Personnel

Dear Respondent,

I am a student of Kwame Nkrumah University of Science and Technology, Kumasi and this study is part of my final work for the award of an MSc Procurement Management. It will take few minutes to complete the questionnaire by circling or ticking the appropriate response that best describes your views. Please be assured that this survey is purely for academic purposes and will not be used for any purpose other than what it is intended.

I count on your kind and timely response to the questionnaires as they are very important to this dissertation.

Many Thanks

Pascal Percy Akibate

A. PERSONAL / COMPANY'S DETAILS

1. Please Tick [] to indicate the category of your company

a. Architectural [] b. Engineering [] c. Construction []

d. Consultancy []

2. Please Tick [] to indicate your position in the company.

a. Procurement Officer [] b. Project Manager [] b. Consultant []

d. Quantity surveyor []

Others please specify_____

3. Please Tick [] to indicate your educational level

a. MSc [] b. BSc [] c. HND [] d. Technician (CTC I,II and III) []

Others please specify_____

4. Please Tick [] to indicate how long you have been involved in the building construction industry

a. 15 years + [] b. 11- 15 years [] c. 6-10 years [] d. 1 to 5 years []

5. Please indicate your years of experience in procurement practices

a. Less than 5 years [] b. 6 - 10 years []

c. 11 - 15 years [] d. More than 15 years []

6. Which of the following system does your organisation use for the timely dissemination of procurement information?

Procurement Proceedings	PPA's Bulletin	News Papers	Radio Stations	Notice Board	Others (Specify)
Publication of Adverts for Invitation of Tenders					
Publication of Contract Awards					

7. Does your Organisation have a website?

(a) Yes [] (b) No []

If yes, please indicate your website?

8. Does your organisation tender for formal bids online to any procuring entity?

(a) Yes [] (b) No []

SECTION B: FACTORS DRIVING THE ADOPTION OF E-PROCUREMENT

On the scale of 1-4 answer the following questions

Scale: 1= Strongly Agree, 2= Agree, 3=Disagree, 4= Strongly Disagree

Factors driving adoption*	1	2	2	4
7. Reduce purchasing cost				
8. Improve productivity				
9. Improve efficiency				
10. Improve effectiveness				
11. Improve internal & external customer service				
12. Standardise purchasing processes across the organisation				

SECTION C: FACTORS INHIBITING THE ADOPTION OF E-PROCUREMENT INITIATIVES

On the scale of 1-4 answer the following questions

Scale: 1= Strongly Agree, 2= Agree, 3=Disagree, 4= Strongly Disagree

Inhibitors to adoption*	1	2	3	4
13. Lack of supplier readiness				
14. Systems integration issues				
15. Unable to justify costs/benefits				
16. Implementation costs				
17. Inadequate technological infrastructure to support e-procurement				
18. Insufficient skilled staff				
19. Lack of management support				

SECTION C: BENEFITS OF E-PROCUREMENT INITIATIVES

On the scale of 1-4 answer the following questions

Scale: 1= Strongly Agree, 2= Agree, 3=Disagree, 4= Strongly Disagree

Benefits of e-procurement	1	2	3	4
20. Improved supply chain integration				
21. Reduced employee overhead				
22. Improved supplier sourcing				

SECTION D: CHALLENGES TO E-PROCUREMENT INITIATIVES

On the scale of 1-4 answer the following questions

Scale: 1= Strongly Agree, 2= Agree, 3=Disagree, 4= Strongly Disagree

Challenges	1	2	3	4
23. Software integration issues				
24. Difficulties with catalogue integration				
25. Difficulty aligning organisational culture with e-procurement				
26. Coordinating inter-organisational information				
27. Assessing cost/benefits				
28. Supplier readiness				

