

E-Procurement Adoption Strategy in the Kenya Public Sector

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E-Procurement Adoption Strategy in the Kenya Public Sector

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Abstract

E-procurement is continuously receiving interest from both public and private sectors. Analysts believe that adoption of e-procurement will lead to efficiency in the procurement process. The objective of this study was to establish e-procurement adoption strategy in the Kenya public sector. The study was conducted in government ministries within Nairobi County between November 2012 and January 2013. The study covered one e-procurement officer and one ICT officer from each of the sampled ministries totalling 42 respondents. This research adopted a descriptive design and it applies a quantitative and qualitative approach. The study was a purposive targeting the key informants; heads of procurement and ICT.

The study established evidence to suggest that the Kenya public sector undertakes some forms of e-procurement because it is believed that certain cost reductions and benefits will arise. Results from the study also revealed that all the ministries have an e-procurement strategy in place, most of which are in the implementation stage- basically “wait and see” strategy. Further results indicated that 25.93% of the respondents strongly agreed that the strategies that are in place are adequate for the implementation of e- procurement within ministries, with a majority 55.56% of the respondents agreeing. This study could have implications within other organisations considering adopting e-procurement. This study recommends areas of further research to include study on other government agencies on and their levels of e-procurement adoption, a comparative study on the public sector and private sector on the adoption of e-procurement.

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List of Abbreviations

ADB	African Development Bank
AEC	Architecture, Engineering Construction
B2B	Business to Business
BC	Before Christ
BI	Behavioural Intention
CGP	Contestable Government Procurement
CPAR	Country Procurement Assessment Report
E-commerce	Electronic Commerce
ECT	Expectation-Confirmation Theory
EDI	Electronic Data interchange
E-MRO	Electronic Maintenance Repair and Operations
E-procurement	Electronic Procurement
ERP	Enterprise Resource Planning
EU	European Union
FSD Kenya	Financial Sector Deepening Kenya
GDP	Gross Domestic Product
GE	General Electric
IT	Information Technology
ICT	Information, Communication and Technology
IS	Information System
KIPRA	Kenya Institute for Public Policy Research and Analysis
NIGP	National Institute of Governmental Purchasing
NRP	Non-Product Related
OECD	Organisation for Economic Co-operation and Development
OGC	Office of Government Commerce
PPDA	Public Procurement and Disposal Act

ROI	Return on Investment
SGS	Société Générale De Surveillance
SME	Small and Medium Enterprises
SSA	Sub-Saharan Africa
TAM	Technology Acceptance Model
TAM2	Technology Acceptance Model Two
TOE	Technology Organisation and Environment
TPB	Theory of Planned Behaviour
TPN	Trading Process Network
TRA	Theory of Reasoned Action
TTF	Task-Technology Fit
WB	World Bank

Operationalisation/Definition of Terms

E-government	Refers to the public sector use of ICT
E-procurement	Is the running of procurement process using ICT; acquisition of goods and services without the use of paper processes
E-readiness	Refers to people's propensity to embrace and use new technology for accomplishing goals in home and at work
Public procurement	Is the acquisition of goods and service by government or public sector organisation

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Dedication

This thesis is dedicated to my Wife, Hawa, Children, Abdullahi and Issa and Grandmother, Hawa Waju (May God Grant her Janatul Firdows-Ameen!).

CHAPTER ONE

INTRODUCTION

1.1 Introduction to the study

Public procurement can be traced back to 2800 BC, but recent advancements in Technology have led to the modernization of public sector procurement processes with great improvement in service delivery. Through the appropriate deployment of e-procurement technologies, procurement process is serving as a key driver of e-business across the economies. Information and Communication Technology (ICT) has continued to provide a means to improve procurement process by providing a digital infrastructure for collaboration.

Growth in e-business remains strong as ICT continue to transform organisations and e-procurement has been identified as the most important element of e-business operational excellence for large organisations. The adoption profiles and reasons for adoption of e-procurement vary as do the desired results. There continues to be a dearth of scholarly concern in this area. This study contributes to the diminutive but increasing lists of studies of e-procurement in the context of the public sectors by studying e-procurement adoption strategy in the Kenya public sector.

1.2 Background of the Study

Different authors define procurement differently. To determine what the term “procurement” entails in Kenya, the provisions of the laws of Kenya is the starting point. Section 3(1) of Public Procurement and Disposal Act (PPDA), 2005 of the laws of Kenya defines: “procurement” as means to the acquisition by purchase, rental, lease, hire purchase, license, tenancy, franchise, or by any other contractual means of any type of works, assets, services or goods including livestock or any combination”.

The African Development Bank (2008) define procurement as the process of acquiring goods, works and services resulting in the grant of contracts under which payments are made in the implementation of projects, in accordance with the governing Rules, Procedures and Guidelines of the financing agency or agencies. Additionally, Telgen (2007) defines procurement as everything associated with an incoming invoice.

The Dictionary of Purchasing Terms (NIGP, 1996, p. 64) defines procurement as “the combined functions of purchasing, inventory control, traffic and transportation, receiving and inspection, storekeeping, and salvage and disposal operations”. Van Weele (2005) in his definition of procurement describes it as a six steps process: specifying procurement strategy, selecting right suppliers, contracting, ordering products and services, expediting and control of deliveries, and follow up and evaluation. Harink (2003) adds procurement management process into the definition of Van Weele (2005).

Procurement in this study is seen in two categories; public procurement and private procurement. This categorization is based on the players or the parties that execute the process. Private and public sectors are reputed to be radically different in the dynamics of their operations. One of the largely common differences pointed to is volume or size, process, corporate culture and accountability. The focus of this study was on public procurement.

Arrowsmith (2005) defines public procurement as the function of purchasing goods or services from an outside body and that it occurs when it is performed by a public agency. By and large, the public sector procurement has more rules, regulations and policy to adhere to (Chamberland, 2005). Additionally, Kumaraswamy, Palaneeswaran and Humphreys (2000) argue publicly owned agencies are very beauracritic in nature and are extremely unwilling to adjust their current behaviour and practices.

Uyarra and Flanagan (2010) describe public procurement as the acquisition of goods and services by government or public sector organizations. This study adopted Uyarra and Flanagan (2010) definition as it covers well the aspect of public sector procurement which is the main thrust of this study. Odhiambo and Kamau (2003) acknowledge the value of public procurement subject both in economic and global business circles. This is supported by the growing interest of the various stakeholders in matters of public procurement in the recent past.

Thai (2001) too argues that public procurement is one amongst the key economic activities of a state. Although it is difficult to estimate the volumes and values of goods and services procured by the public sector in Kenya, recent publication by Financial

Sector Deepening Kenya (FSD Kenya, 2008) puts an estimate of about Kshs. 300 billion for the financial year 2006. The publication goes on to note inefficiencies in the public sector procurement costs the Kenya government about Kshs. 30 billion annually. These inefficiencies are as a result of higher inventory levels, high cycle time, elevated administration costs, uncontrolled maverick spending and high purchase price.

Due to the mentioned inefficiencies identified above, corruption is a major problem in the public sector as was found by a study conducted recently by World Bank showing as much as 12% of GDP in countries like Kenya, Venezuela, Sri Lanka and Nigeria (Nwabuzor, 2005). Studies conducted by Centre for Advanced Procurement Studies in 2004 have found out companies spending 48% of every dollar sales on procuring goods and services used in operations. Research has indicated that public procurement is a key part of a demand oriented innovation strategic policy in the general public (Edler & Georghiou, 2007; Aschhoff & Sofka, 2008).

Commonwealth Procurement Guidelines (2005) identify the core principle governing public procurement as value for cash while the other principles include the principle of efficiency, effectiveness, competition, accountability, and transparency, ethical consideration and industry development. Similarly, efficient public procurement is not only encouraged and promoted by the world major lenders such as World Bank (WB) and African Development Bank (ADB) but it is a necessity, (Arrowsmith & Davies 1998).

1.2.1 Public Procurement System in Kenya

Public Procurement System in Kenya has evolved from a system with no regulations to an organized legally regulated procurement system as established by PPDA, 2005. Initially contained in the Supplies Manual of 1978, which was in force until 2001, this was supplemented by the Ministry of Finance through treasury circulars that were issued from time to time (www.ppoa.go.ke).

Since 1978, the public procurement in Kenya has been undergoing reforms. In 1986, a study was commissioned by Kenya government and conducted by Société Générale De Surveillance (SGS) Consultants to evaluate public procurement systems in Kenya. The major finding of the study was that public procurement was not operating efficiently and

that the state was losing a lot of money through shoddy deals. The report strongly indicated the need for reforming the public procurement system in the country. The study further revealed that procurement staff were not adequately trained and lacked professionalism. Lack of a professional body that would oversee and instil discipline among procurement officers made them vulnerable to corruption.

In 1997, the Government of Kenya in collaboration with the World Bank commissioned another study to assess the country's procurement processes and systems. This study identified the need for a comprehensive review and an implementation of a reform process in the procurement systems. The study also revealed that the public procurement system in Kenya lacked transparency and fair competition (Odhiambo & Kamau, 2003).

One of the key recommendations from these two studies was that reforms in public procurement systems were vital if government was to save resources otherwise lost through inflated procurement. The World Bank study argued that improvement in procurement systems had a direct and beneficial effect on the overall economic situation in the country (Odhiambo & Kamau, 2003).

According to e-government strategy paper 2004, e-procurement was one of the medium term objectives which were to be implemented by June 2007, but the process has been very slow. The manual processes are costly, slow, inefficient and data storage and retrieval poor (Okello, 2009). One way of reforming the public sector procurement is through the use of e-technology as alluded to by Croom and Brandon-Jones, (2005), Carayannis and Popescu (2005).

1.2.2 Public Procurement and Disposal Act (PPDA), 2005

The introduction of the PPDA, 2005 and the Procurement Regulations of 2006 introduced new standards for public procurement in Kenya. For instance, the rules and regulations embodied in public procurement act establish the key institutions involved in the regulation of public procurement. These institutions include Public Procurement Oversight Authority (PPOA), Public Procurement Oversight Advisory Board (PPOAB), and Public Procurement Administrative Review Board (PPARB). PPDA, 2005 is the

reference point for all public procurement and related matters in Kenya. It covers all the types and procedures of acquiring of goods and service in the public sector.

Part IV to Part VI of PPDA, 2005, specifies the general rules and method for all procurement procedures applicable in the public entity. Open tendering is the most widely used and favorite tendering system. The restricted tendering is a procurement procedure where bids are obtained by direct invitation without open advertisement. Procurement entities are also allowed in exceptional circumstances to call for quotations and proposals.

Quotations and proposals are simplified procurement procedures, which compare price quotations obtained from a number of providers. Quotations are mainly used for goods that are readily available and for which there is established market; and the estimated value of the goods being procured is less than or equal to the prescribed maximum value for requests for quotations, while proposals are used for services or a combination of goods and services and that the service to be procured are advisory or otherwise of a predominantly intellectual nature.

Direct procurement is a sole source procurement method used when exceptional circumstances prevent competitive bidding. Other methods include low value procurements and specially permitted method such as "concessioning" and "design competition".

1.2.3 E-technology and procurement

E-technology represents a platform for providing e-activity with the concrete content for the particular subject (usually user group). For example, e-selling as the e-activity enables online selling (content) for customers (subject). In this case e-technology is usually any kind of electronic shop (Malo, 2010). Tassabehji, Wallace and Cornelius (2007) also describe e-technology as a new and continuously evolving platform from which an organization can exploit new opportunities. E-technology can therefore be considered to provide increased speed; centrality, and cost savings, thus, firms should focus the bulk of their efforts on building e-technology enhancements that benefit both parties over the long term (Kiele, 2001).

1.2.4 Role of ICT in public procurement

Hawkins, Robin and Edward (1998) believe that ICT offers colossal benefits when ICT outlay is combined with other organisational assets, such as new strategies, new business processes, new organisational structures and better worker skills. Aiyepoku (1994) states that the strong interest in the adoption of ICT to provide information services emerged in Sub-Saharan Africa (SSA), including Kenya, for three reasons: one, the revolution in ICT has resulted in computer hardware becoming affordable. Two, the substantial, value added, utility of ICT in the provision of, and access to, information services for improved planning and organizational management has become more widely recognized. Three, the international development agencies and donor countries have exerted momentous pressure upon several governments, institutions of higher learning and other recipients of their support, stealthily and explicitly, in developing countries to adapt the extensive use of ICT to improve their workforce performance and organizational management.

Various studies have been made on e-Government adoption, implementation and their impacts on e-procurement (Brown, 2007; Moons & Norris, 2005; West, 2004). Brown's study revealed that although a maturational model may be helpful for describing aggregate efforts, it is less useful in understanding the potential for individual gains. Moon and Norris (2005) study found that managerial innovativeness orientation and city size are the most compelling determinants of municipal e-government adoption. Different levels of e-government adoption may yield different outcomes. According to West (2004), the e-government revolution has fallen short of its potential to transform service delivery and public trust in government. It does, however, have the possibility of enhancing democratic responsiveness and boosting beliefs that government is effective.

1.2.5 Adoption theories for ICT

While there are many theories used in Information Systems (IS) research (Wade 2009), evaluation of these adoption models indicate the following theories to be key in ICT adoption: the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB) (Ajzen 1985, Ajzen 1991), the Technology Acceptance Model (TAM) (Davis 1986, Davis 1989, Davis Bagozzi and Warshaw, 1989), Task-Technology Fit model (TTF), Expectation-Confirmation Theory (ECT), TAM2 – an extension of the TAM and

Unified Theory of Acceptance and Use of technology (UTAUT) (Venkatesh, Morris Davis and Davis, 2003), Diffusion on Innovation (DOI) (Rogers, 1995) and Technology-organization-environment (TOE) model (Tornatzky and Fleischer, 1990).

The TOE Framework (Figure 1.1) has emerged as a handy theoretical lens for understanding technology adoption. It has been generally used in the context of e-business for studying the adoption and assimilation of IT innovation (Oliveira & Martins, 2011).

The TOE framework as at first presented, and later adapted in IT adoption studies, provides a valuable logical framework that can be used for studying the adoption and absorption of different types of IT innovation. The TOE framework has a solid theoretical basis, consistent empirical support and the potential of application to IS innovation domains, though specific factors identified within the three contexts may vary across different studies. This includes current practices and equipment internal to the firm (Starbuck 1976), as well as the set of available technologies external to the firm (Thompson 1967, Khandwalla 1970, Hage 1980), and the environmental context is the field in which a firm conducts its business—its industry, competitors, and dealings with the government.

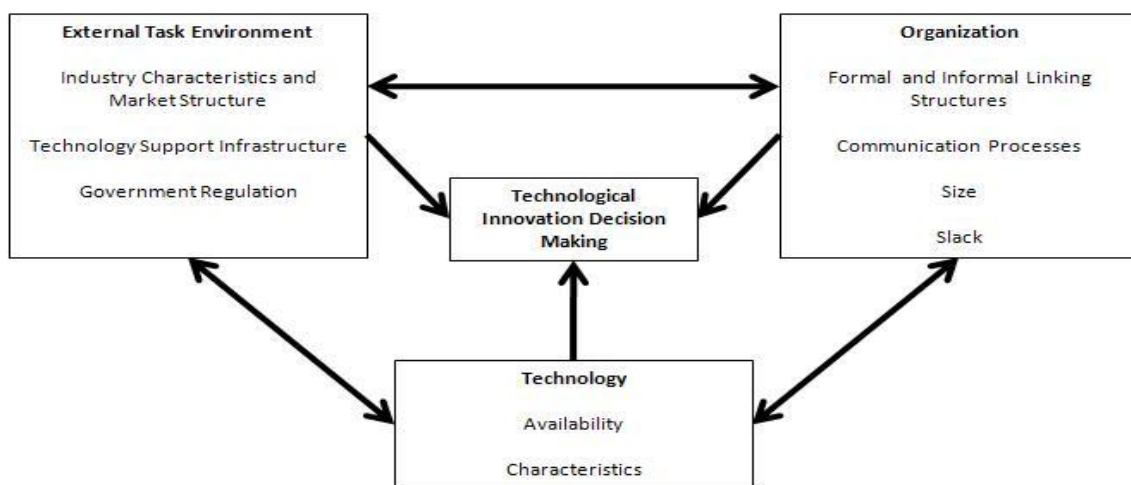


Figure 1.1: Technology-organization-environment framework

Source: Tornatzky and Fleischer (1990)

The TOE framework Figure 1.1 by Tornatzky and Fleischer (1990) explains the adoption of technological innovations and identifies three aspects of a firm's context that can influence the process by which companies adopt technological innovations: the organizational context refers to descriptive measures about the organization such as scope, size, and managerial structure, the technological context describes both the internal and external technologies relevant to the firm.

TOE and DOI are the only ones at firm level as the rest are at the individual level. DOI is a theory of how, why, and at what rate new ideas and technology spread through cultures, operating at the individual and firm level. DOI theory sees innovations as being communicated through certain channels over time and within a particular social system (Rogers, 1995).

1.3 Statement of the problem

Salient features of public procurement in Kenya relates to the spending of public money. Public agencies have to follow prescribed rules and procedures formulated from time to time and have to enable in the discharge of procurement related functions in the most efficient, fair, just economic and transparent manner.

Procurement is an imperative and expensive business activity for organizations (Chan & Lee, 2003). This is because organizations including government ministries and agencies usually spend a large portion (up to 70%) of their revenue/operational budget on purchasing goods and services (Sebauer & Segev, 1998). Moving procurement to the internet essentially saves process costs through time and resource savings as well as product costs through intensified competition on public contracts.

According to Schoenherr and Tummala, (2007), study of e-procurement literature since 1997 to 2006 has established only 13% have been conducted on the general public sector. Manufacturing segment, health sector, and retail division each contributed 14%, 5%, and 5% respectively to e-government. Most of these studies focused mainly on large economies and technology-oriented industries this explains the lag-behind in the adoption of e-technology within the public and hence its non-adoption of e-procurement (Tatsis, Mena, Wassenhove & Whicker 2006). Ogden, Petersen, Carter and Monczka, (2005),

Williams, Elliot, Kim, Catherine & Kim, 2006) indicates that many organisations have realised the potency of having e-procurement systems in their procurement processes but the adoption rate does not measure with the existing demand.

In spite of the claimed business benefits that can be obtained by embracing e-procurement, the extent of adoption in the public sector in Kenya is below expectations though progressing slowly (Okello, 2009). Literature indicates that adoption of e-procurement in public sector is still a challenge as a result of internal resistance to change. In Kenya, the same challenges appear to replicate (Klischewski, 2007; Angeles & Nath, 2007; Rehan, 2006; Hawking, Wyld & Forster, 2004; Quayle, 2005; Chen & Rankin, 2006; Afsharipur, Afshari & Sahaf, 2006; Scholl and Aman and Kasimin, 2011) .

The adoption and use of appropriate elements of e-procurement to all aspects of Kenya's public sector including government ministries and departments is perceived as a critical aspect of driving efficiencies. Therefore, this study endeavours to establish the available e-procurement adoption strategies in the Kenya public sector.

1.4 Research objectives

The objective of this study was to establish e-procurement adoption strategy in the Kenya public sector, guided by the following specific objectives:-

- i) To evaluate the drivers of public e-procurement.
- ii) To evaluate e-procurement readiness in public sector.
- iii) To determine the e-procurement strategies available.
- iv) To establish e-procurement adoption strategy in Kenya public sector.

1.5 Research questions

Based on the research objectives established above, the study aims to answer the following research questions:-

- i) What are the drivers of public e-procurement?
- ii) What is the e-procurement readiness in the Kenya public sector?
- iii) What are the e-procurement strategies available?
- iv) What is the e-procurement adoption strategy in the Kenya public sector?

1.6 Scope

The study focused on e-procurement adoption strategy in the Kenya public sector. The ICT adoption framework developed was based on TOE framework by Tornatzky and Fleischer. The TOE framework asserts that three principle contexts – technological, organizational, and environmental influence the process by which an organization adopts and accepts a new technology. The study addressed the drivers to e-procurement; e-procurement readiness and the available e-procurement adoption strategies in the Kenyan public sector.

The technological context considers the available technologies important to the firm, both internal and external, that might be useful in improving organizational productivity. The organizational context is defined in terms of resources available to support the acceptance of the innovation. These criteria include firm size and scope; the centralization, formalization, interconnectedness, and complexity of the managerial structure; and the quality and availability of the firm's human resources. The environmental context represents the setting in which the firm conducts business, and influenced by the industry itself, its competitors, the firm's ability to access resources supplied by others, and interactions with the government. The study was conducted in government ministries within Nairobi County between November 2012 and January 2013. The study covered one e-procurement officer and one ICT officer from each of the sampled ministries totalling 42 respondents.

1.7 Significance of the study

The study is important to the following:

Scholars and academicians-The study provides information to potential and current scholars and academicians on the e-procurement adoption strategy in Kenya public sector. It also expands the existing knowledge in e-procurement in general and specifically that which is related to the public sector. The study findings also extend important issues of e-procurement adoption in the public sector using the Kenya public sector as a case thus building a rich empirical foundation for future e-procurement research.

The Kenya Government-The analytical results and findings of the study helps the Kenya government in formulating appropriate strategies and policies geared towards the adoption of e-procurement in the public sector. The results of the study also helps the government in developing appropriate approaches that can be adopted to overcome the challenges associated with the adoption of e-procurement in the public sector.

The procurement officers in the public sector- The study enables procurement officers to appreciate the adoption of e-procurement as a contemporary practice which deserve keen attention. The procurement officers finds the study important especially those who do not have ICT competence and hence seek further training to enable them execute the practice without difficulties.

1.8 Delimitation of the study

The focus of this study is on adoption strategy of e-procurement in the Kenya public sector and therefore was limited only within the Kenyan public sector even though the results was generalised. Regarding geographical delimitation, the scope of this study has been confined to the sampled ministries headquarters that are operating within Nairobi area.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Chapter two discusses the literature on e-procurement. Literature review is critical to the scholarly background needed for a subject in any research that is undertaken. Therefore, this chapter presents an analysis of the review of literature relevant to the subject under study. It also attempts to define e-procurement concept and establish the drivers and antecedents of e-procurement. The review processes produce an important understanding of important interrelationship among the specific subject of interests. The overarching aim of this review is to examine the published literature with respect to e-procurement adoption.

2.2 The Concept of E-procurement

Muffato and Payaro (2004) reveal that with the dawn of the internet, procurement became the core process to be redesigned and reorganised so as to reflect on the new developments. Fisher (2000) states that e-procurement is more than putting purchasing decisions online, its functions also include linking suppliers and buyers into the purchasing network and rethinking of business processes such as transactions. It is imperative to note that e-procurement is not a case of re-engineering aged manual processes but a re-engineering of the process itself (Sheng, 2002).

Public sector organizations spend billions of dollars procuring products when implementing their concepts and strategies. Procurement in general represents one of the leading expense items in an organisation cost make-up (Lennon, 2002; Attaran & Attaran, 2002). Studies have established that organisations spend no less than one-third of their income on the purchase of goods and services (Zenz & Thompson, 1994; Killen & Kamauff, 1995). A research by Price Waterhouse Coopers has suggested a 10 per cent decrease in procurement expenditure could easily lead to a 50 per cent rise in profit margin (Sheng, 2002).

Kalakota and Robinson (2001) have referred to the evolution of procurement process from the back-end process to a strategic resource and how procurement acts as a principal

driver in the extended supply chain, from the supplier to the end-customer. According to Wirtz (2009), the word e-procurement in public administration means the running of public procurement processes using information and communication technologies, principally with the help of the Internet. The endeavour is to advance and optimize public allocation processes in order to boost the efficiency of public procurement overall.”

Forrester Research, a consulting firm, predicted that e-procurement will grow 99% annually and Goldman Sachs, an investment bank, forecasted that e-procurement transactions will reach US\$1.5 trillion by 2004 (Ageshin, 2001). The position of public procurement of innovations has engrossed attention in many parts of the world such as Canada (Curry, 2005); China (The US – China Business Council, 2010; Li, 2011); New Zealand (Ministry of Economic Development, 2005); India (Mani, 2003); Japan (Myoken 2010). According to Al-Mashari, Irani and Zairi (2001), Attaran (2003) and Terziovski Fitzpatrick and O’Neill, (2003), organisations have been focusing on the expansion of more versatile coordinative team and communication capabilities since the 1990s.

E-procurement in the public domain can be seen as a policy tool to support the delivery of public procurement policy, improving transparency and efficiency (Carayannis & Popescu, 2005; Croom & Brandon-Jones, 2005). E-procurement can assist a government in the way it does business by reducing transaction cost, making better decisions and getting more value (Panayiotou, Gayialis & Tatsiopoulos, 2004).

E-government is the design of government website or portal where information and other internal processes about a government are posted. It is the use of ICTs to change the internal and external operations of government so as to optimize government service delivery. Sudan 2005 in Asogwa and Asiegbu (2009) defines e-government as the use of ICT by government to enhance the range and quality of government information and services provided to the citizens in an efficient, cost-effective and convenient manner. It is Internet-based public administration (Kitaw, 2006).

E-government has been described by Reitz (2006) as the exploit of ICT to aid relations between, on the one hand, a public authority and, on the other hand, individual citizens, businesses, or non-governmental organizations. Mitchell (2000) distinguishes

conventional procurement and e-procurement. Mitchell points out customary procurement as paper based and lacks control over expenditures whereas e-procurement facilitates, integrates, and streamlines the entire supply chain process in a seamless, instantaneous, and iterative manner.

This distinction is consistent with the definition by Przymus (2003) who defines e-procurement as the acquisition of goods and services without the use of paper processes. It is also critical to differentiate the terms Electronic Data Interchange (EDI) and e-procurement and to note that they are not one and the same.

EDI is an “electronic handshake” between two entities that are integrated with each other, one being the buyer and the other being the supplier. Conversely, e-procurement is the use of web-based system to select potential vendors, bid, order and in software cases, delivers invoices and pay on-line with a variety of suppliers. E-procurement is a subset of e-commerce (Przymus, 2003).

E-procurement takes place in e-marketplaces which are specific websites on the internet that aim to bring buyers and sellers together in order to facilitate the application of various forms of e-procurement. Some of these are quite well defined and well developed and Table 2.1 below provides description of this e-procurement forms.

Table 2.1: E-procurement forms and explanations

E-procurement forms	Description
E-ordering	The process of creating and approving purchasing requisitions, placing purchase orders and receiving goods and services by using a software system based on internet technology. The goods and services ordered are MRO (Maintenance, Repair and Operation) or NPR (Non-Product Related). The software systems contains of an ordering catalogue system preferably used by all employees of an organization.
Web-based ERP	The same process as in the case of e-MRO, but with web-oriented ERP, the goods and services ordered are product related.
E-sourcing	Includes the process of identifying new suppliers for a specific category of purchasing requirements using internet technology. It can lead to identification of new suppliers, which can lead to increased competitiveness in the tendering process. It is also a way of decreasing the supply risk associated with a purchasing category.
E-tendering	The process of sending requests for information and prices to suppliers and receiving the responses of participants using internet technology. It sometimes also concerns the analysis and comparison of responses, but excludes the process of closing the deal.
E-reverse auctioning	An auction enables a supplier to sell goods and services to a number of known and unknown buying organizations. Within a relatively short time frame, the buying organization involved submits bids for the goods and services that are auctioned. A reverse auction is the opposite and enables one purchaser to buy goods or services from a number of known or unknown suppliers.
E-contracting	The use of a contract management system linked to an automated ordering and /or payment system.
Purchasing Intelligence	Concerns the process of uploading purchasing data and the analysis of this data into valuable purchasing information.

Source: De Boer et al. (2001)) (p-28)

2.3 Drivers of e-procurement

Supplier involvement is a crucial external force that can persuade e-procurement uptake (Carr & Smeltzer 2002; Ellram & Zsidisin 2002; Subramanian & Shaw 2002; Croom & Brandon- Jones 2004; Zahay & Handfield 2004; Dooley & Purchase 2006; Wu, Zsidisin

& Ross 2007). Opposition exists in preceding research with Carr and Smeltzer (2002) and Zahay and Handfield (2004) finding supplier participation having no effect on uptake. Deeter-Schmelz, Bizzari, Graham and Howdyshell, (2001) points out also the aspect of pressure from the suppliers on their customers to become involved in the use of e-commerce to trim down costs, improve communications and increase operational efficiencies. The continuous drive towards organisational efficiency and lowering the cost to conduct business is also driving the adoption of E-procurement (Lancioni, Smith & Schau, 2003).

According to Walker and Harland (2008) there are five factors that come out to sway the adoption strategy of e-procurement – organizational, readiness, supply, strategic and policy factors. Information technology has been a key enabler in procurement's evolution into a more strategic business function, by reducing the time taken to complete mundane tasks and allowing procurement agents to focus on more value-added activities. The Internet and electronic commerce especially have much to offer in the way of increasing the efficiencies and competitive advantage of procurement (Rajkumar, 2001).

Studies by Dooley and Purchase (2006) has shown suppliers' participation, internal managerial support and the perceived benefits gained through implementation all influence e-procurement intentions. Earlier researches has discussed several internal organisational factors that positively influence e-procurement adoption including staffing levels, training in new technologies; encouragement from management and other departments (Osmonbekov, Bello & Gilliland, 2002); sufficient financial and resource backing (Joo & Kim, 2004). Dependable and safe connectivity would increase organisation intentions to use e-procurement (Dooley & Purchase, 2006).

Motiwalla, Khan and Xu, (2005) in their research established that similarities in the level of IT adoption were recognized within sectors because engaging in a particular activity prompts organisations to develop similar behaviour patterns. Table 2.2 summarizes the major drivers of e-procurement as identified through the presented body of literature.

Table 2.2: Main Drivers of E-procurement as identified through the existing body of literature

No.	Drivers from Literature	Referenced in
1	Process cost savings (Tender / Purchase Process)	Knudsen (2003), Minahan and Degan (2001), Martin (2008)
2	Service / Material / Product Cost Savings	Minahan and Degan (2001), Martin (2008) – Reduced Waste
3	Transaction Administration Cost Savings	Davila et al (2003) and Panayiotou et al (2003)
4	Reduced Administration Costs	Egbu et al (2003), Hawking et al (2004), Raghavan and Prabhu (2004)
5	Increasing Profit Margins	McIntosh and Sloan (2001), Wong and Sloan (2003) , Ribeiro (2001)
6	Strategic Cost Savings	Knudsen (2003)
7	Enhanced Inventory Management	Hawking et al (2004), Martin (2008)
8	Decrease in Costs through reduced staffing levels	Kong (2001), Davila et al (2003), Egbu et al (2003)
9	Shortened Overall Procurement Cycle Times	Minahan and Degan (2001)
10	Shortened Communication Cycle Times	Knudsen (2003)
11	Reduction in time through greater transparency(Less objections)	Panayiotou et al (2003)
12	Reduction in Evaluation Time	Panayiotou et al (2003), Martin (2008)
13	Reduction in Time through improved internal workflow	Panayiotou et al (2003)
14	Reduction in purchasing order fulfilment time - Contract Completion	Davila et al (2003)
15	Reduction in time through increased visibility	Kalakota et al (2001)
16	Increased Quality through increased competition	Kalakota et al (2001)
17	Increased Quality through Benchmarking (Market Intelligence)	Hawking et al (2004)
18	Increased Quality through increased visibility in the supply chain	Minahan and Degan (2001) and Hawking et al (2004)

Source: Shakir, Smith & Gulec (2007) (p-22)

2.4 E-procurement readiness

E-readiness is an antecedent of e-procurement and thus the need to establish the aspect of ICT readiness in general and e-procurement uses the platform of ICT. The concept of e-readiness originated as a result of an attempt to provide a unified framework to evaluate the breadth and depth of the digital divide between the developed and developing countries during the later part of the 1990s.

Computer Systems Policy Project (CSPP), a public policy backing group comprising US information technology companies defined e-readiness with respect to a community that has high-speed access in a competitive market; with constant access and application of ICTs in schools, government offices, businesses, healthcare facilities and homes; user privacy and online security; and government policies which are favourable to promoting connectedness and use of the network (Bridges.org, 2001). Docktor (2002) observes that the term e-readiness represents the multiple levels of ICT development.

The United Nations University International Institute for Software Technology defines e-readiness as “how well a society is positioned to utilize the opportunities provided by Information and Communication Technologies” (Ojo, Janowski & Estevez 2007, p. 1). While defining e-readiness, e-Business Group, a research centre at the Massachusetts Institute of Technology, focuses on “the ability to pursue value creation opportunities facilitated by the use of the Internet” (Choucric et al., 2003, p. 5).

Similarly, Agriculture and Food Canada (2001) points out that there are many degrees of e-readiness and each could include any one or more than one of the following activities: Using e-mail as the most preferred communication method; using a website for internal and external communications; selling goods and or services using the internet; making travel arrangements using online internet services; finding and purchasing computer equipment and software, supplies and even services through a company website; sending electronic invoices to customers and receiving electronic bills from suppliers; and electronically paying and receiving payments.

Parasuraman and Rockbridge Associates, Inc. developed the technology readiness index (TRI) to measure technology readiness. Empirical studies have established that technology have both positive and negative facets, and can be categorized into four distinct technology readiness dimensions, namely, optimism, innovativeness, discomfort, and insecurity (Mick & Fournier, 1998; Parasuraman & Colby, 2001). The results of e-readiness rankings of countries have regularly been published annually by some agencies.

The last decade has seen ICT dramatically transforming the world, enabling innovation and productivity increases, connecting people and communities, and improving standards of living and opportunities across the globe. No nation and no region have a monopoly on innovation and new thinking. There is no area on the globe that has an inherent advantage in asking new questions, or exploring new areas. Digital economies, unlike the industrial economies of the past, do not rely on natural resources but on smart, ambitious individuals. There are many places on earth that can aspire to be the next Silicon Valley, the next Nanjing-Beijing corridor, the next Singapore. (The Global Information Technology Report 2010–2011).

The technology readiness construct refers to people's propensity to embrace and use new technology for accomplishing goals in home life and at work (Parasuraman, 2000). It measures an overall state of mind resulting from a combination of mental enablers and inhibitors to determine a person's preference to use new technologies.

Universal access to ICTs has been identified by the Kenya government as a major objective of its Vision 2030 efforts. The Vision 2030 document is a strategic plan developed by the government of Kenya in order to make Kenya a middle income country providing high quality services life for all its citizens by the year 2030. It is expected that greater access to ICTs will contribute to economic growth by reducing transaction costs and increasing businesses efficiency.

Availability of fast and reliable internet is very critical for the success of e-procurement adoption in the public sector or for any organisation. However, according to a study commissioned by Communication Commission of Kenya (CCK) in 2011 indicated that the greatest challenge continues to be the internet and especially broadband. The number

of internet or data subscriptions reached 4.7 million at the end of the second quarter of 2011 (around 10 million of users) according to this study.

In Kenya, ICT issues are considered under various pieces of legislation. These include the Kenya Communications Act of 1998; the Science and Technology Act, Chapter 250 of 1977; and the Kenya Broadcasting Corporation Act of 1988. The national ICT policy (The Kenya Gazette, 2006) recognizes that these Acts are inadequate in dealing with issues of convergence, electronic commerce and e- Government. Inclusion of e-transactions in the Kenya Communications (Amendment) Act, 2009, is a great step in the right direction.

In assessing e-procurement adoption strategy in the Kenya public sector this study has assessed in the areas of environmental context (regulatory framework, trading partners readiness and government promotion), technological infrastructure (telecommunication infrastructure, software and hardware, technology readiness, perceived benefits and barriers) organisational conditions (administrative structures, perceived benefits and perceived barriers).

2.5 E-procurement adoption strategies

Cloate (2007) acknowledges UN and World Bank have adopted e-government as a developmental instrument. Because of the benefits that accrue from the execution of e-government. U.N. E-Commerce and Development Report (2004) point out four significant elements for e-procurement as follows:

- **On-line tenders:** with bidders having the ability to search and identify tenders, online forms and automated, online submission capability.
- **Electronic invoices:** ability to allow for issuing and receiving invoices electronically.
- **Electronic payments:** ability to allow for electronic funds transfer with necessary approval cycles through authenticated digital signatures and process management.
- **Automated process integration:** electronic automation of all of the above elements in an end-to-end e-procurement.

The e-procurement field is still growing with the expansion of technology and fresh models to serve the needs of the market. There are diverse strategies that organisations

espouse towards-procurement technologies. The bulk (70%) are taking a “wait and see” approach (strategy). These organisations are either conscious of the developments, but not committing capital (37%) or investing selectively until the best e-procurement model can be identified (33%). These organisations do not perceive that the existing circumstance of expansion qualifies changing their conventional procurement process to the world; nonetheless, they are active in experiments and extensive. (Davila *et al*, 2002).

A moderate number of organisations are taking aggressive strategy (27%), stating that they are adopting e-procurement technology declaring that they are investing significantly to gain a competitive lead (3%) or moving ‘fast into e-procurement solutions (24%) (Cohen & Levinthal, 1990). A lesser set of organisations (4%) adopting a more passive strategy of observation without experimentation. Their sufficiency (and risk) will depend on how speedily organisational learning can be absorbed without creating, the “absorptive capacities” that the wait and see organisations seem to be developing. This strategy is defined as riskier in the absence of any well defined solution and companies may end up betting on the wrong technology. One third of all respondents believe that at least 40% of their competitors are implementing or have plans to implement an e-procurement strategy. Among organisations pursuing an aggressive strategy, over 50% believe that their competitors are doing the same (Davila *et al*, 2002).

Electronic government (E-government) has its beginning in Britain (Koontze, 2003) when in 1957, the British government directed the technical support unit of the telecommunication service to appraise and give counsel to government on the use of computers in government offices. Mnjama, Wamukoya and Mutula (2008) noted that since that directive from the British government, many countries have progressively introduced computers into their public administration.

Kaufman (1999) asserts that procurement is more considerable than sales in terms of its influence on organisation figures. Kaufman claim is supported by a case study at Mercedes Benz which found out that a 10% increase in turnover had the same effect on the results as a reduction in material costs of 0.518% due to the leverage of

procurement costs. Matechak (2005) opined that public procurement is one of the key areas where the public sector and the private sector relate financially that is a principal candidate for fraudulent activity, cronyism, and favouritism as well as outright bribery.

A policy and regulatory framework is a necessary precondition for enhanced digital inclusion in an information society (Commonwealth Telecommunications Organization 2004). E-procurement includes sourcing, negotiations with suppliers, and R&D co-ordination taking place on the internet and electronic market which are begged on the institutional policy framework (Yen & Ng, 2003). Knudsen (2003) included into e-procurement: e-sourcing, e-tendering, e-informing, e-reverse auctions, e-MRO, and web-based enterprise resource planning (ERP).

In March 2004, the Government of Kenya launched an ambitious three year (2003-2007) E-government Strategy in line with the national development strategy for Wealth and Employment Creation. Although it may seem easier to say that organisations are now realizing the importance of the e- procurement solutions two types of adoption strategies exists in the literature. These are total replacement model and conservative adaptation model.

Those companies that adopt total replacement model discard the traditional models and they continuously involve in experimental advanced implementations. While those that adopt conservative adaptation model select one technology then the other. They are generally concerned with the "Wait and See" approach. They retain their traditional practices up to some extent.

2.6 Benefits of E-procurement adoption in a public sector

E-procurement solutions have broad appeal because they span across the market sectors and industries (ciol.com 2007). Applicability of e-procurement in various sectors and both tangible and intangible benefits of e-procurement applications are well-discussed in literature with benefits often to the tune of millions of dollars. Tatsis, Mena, Wassenhove and Whicker (2006), Davila, Gupta and Palmer (2003), Miller (2006), Rehan (2006) and Panayiotou Sotiris and Tatsiopoulos (2003) provide various classifications of benefits of e-procurement. Carter et al (2004) describes buyers who

have adopted e-procurement and most agree that it increases levels of trusts, provides greater access to supplier data, and decreases cycle time for suppliers.

Organisations need to gain from the savings presented by e-procurement to stay competitive (Angeles and Nath 2007), while transferring supply management skills towards more strategic activities such as supplier integration and relationship management (Ogden, Petersen, Carter & Monczka, 2005; Pushmann and Alt 2005). These days automating the requisition-to-pay process remains the most momentous intention of an enterprise's e-procurement plan (Aberdeen 2006).

There has been extensive research done on the benefits obtained on the adoption of e-procurement (Osmonbekov *et al.* 2002; Puschmann & Alt 2005). Osmonbekov, Bello, and Gilliland, (2002) points out that e-procurement tends to flatten organisation structure because the levels of management activity involved in the procurement process reduce. Many scholars equally assert e-procurement enhances transparency in the entire system (Croom & Johnston, 2003; Bartezzaghi & Ronchi, 2003).

IBM saved a colossal \$377 million in 2000 by procuring their goods and services by electronic means (IBM, 2002). Previous survey conducted by Aberdeen Group's (1999) found out that internet procurement delivers considerable return on investment (ROI) through reduced prices for goods and services; shortened order processing and fulfilment cycles; reduced administrative burdens and costs; improved control over off-contract spending; and better inventory control. Further, the report go on to say that adoption of e-procurement lead to reduction in purchase and fulfilment from 7.3 days to 2 days, administration costs reduced to \$30 from \$107 per order requisition respectively compared to conventional paper-based procurement.

The Institute for Supply Management claim the cost saving and efficiencies to be gained through electronic sourcing can provide benefits not only to entities that use them for the acquisition of goods and services but in the aggregate economy as a whole (Setton & Wyld, 2003). In a study of Australian organisations, Williams and Hardy (2007) identified that the most important factor for buyers in e-procurement adoption was reduction of prices. The study by Tanner et al. (2008) found that in e-procurement

adoption, reduction in purchasing price was the highest priority among 12 cited goals for e-procurement. Eakin (2003) identified benefits such as transactional, compliance, management information, price and payment accruing to e-procurement adoption. Boyer and Olson (2002) found that costs were reduced and inventory accuracy improved through e-procurement tools.

General Electric (GE) in the USA is a company which is realising benefits by using the internet. Its trading process network (TPN) is an online business that allows to transact over US\$ 1 billion worth of business with more than 1400 suppliers around the world. TPN simplifies the old time-consuming contract bidding and award process (Bahreman, 2010).

The most important benefits of e-procurement in a study of the fifty leading United Kingdom companies found out to be better resource usage, adding value through leveraging, and eliminating maverick buying (Tomorrow first, 2000). A report by Office of Government and Commerce, OGC (2005) indicates e-procurement is seen as a powerful means of achieving efficiency and has an indirect effect on cash savings by providing the access to good deals.

Ramamurthy, Premkumar and Crum, (1999) and Sriam et al., (2008) illustrate from an operational point of view, the automation and acceleration of data handling storage and transmission can enhance data accuracy and reduce the number of errors. E-procurement most important benefits is it lowers transaction costs (Subramanian & Shaw, 2002). Buyers indicated that the transfer from paper-based to e-procurement resulted in a decrease of 5% to 10% on purchasing price, 25% to 50% drop at inventory level, a 5-day reduction in cycle time, a US\$77 saving in per requisition administrative cost (Brack, 2000).

Pressutti (2003) quotes a price decline in the array of 5% to 20% because of being able to reach a wider provider base and identify unidentified and qualified sources of supply. The ICT writing in general (Dewar & Dutton, 1986; Galbraith, 1977; Min & Galle, 1999; Sigala, 2003; Siguaw, Enz & Namasivayam, 2000) has established that larger

organizations are more likely to facilitate ICT novelty and implementation due to their financial aptitude, infrastructure and organizational clout.

According to Aberdeen Group's (1999) study, internet procurement now delivers noteworthy ROI through reduced prices for goods and services; shortened order processing and fulfilment cycles; reduced administrative burdens and costs; improved control over off-contract spending; and better inventory control. The study goes on to state that by introducing internet procurement, purchase and fulfilment cycles reduced 2 days from 7.3 days compared to traditional paper-based procurement, administration costs reduced to \$30 from \$107 per order requisition.

Due to the uncertain correlation between forecasts and actual needs, suppliers are inevitably forced to prepare huge amounts of stock if there is no information sharing companies, and excessively large inventories are a waste of resources. Information sharing between B2B partners can therefore improve the efficiency of the entire supply chain (Corbett, Blackburn & Wassenhove, 1999). Swaminathan and Tayur (2003) point out that, with ubiquitous adoption of the internet, companies can use the internet to transmit information in real-time to vendors and customers, helping to coordinate or corporate.

Traditional procurement process needs more labour processing and these results in shortcomings of producing the errors such as keying in data and these increases the cost. On the converse, the web based e-procurement system can automatically route product requests for the necessary approvals and order placements with suppliers. Hence, the system not only requires minimal data input but also decreases the error cost during the information-process cycle.

Smith-Deighton (2004) argues that transparency requires governments to adhere to higher standards of conduct by ensuring that conduct will be open to scrutiny. Transparency International (2006) defined transparency as laws, regulations, institutions, processes, plans and decisions that are made accessible to the public at large or at least to "representatives" of the public so that processes and decisions can be

monitored, reviewed, commented on and influenced by the stakeholders, and decision makers can be held accountable for them.

A research by Evenett and Hoekman (2005) has shown that a lack of transparency can hamper the capacity of new companies to bid for contracts even if there is no unfairness. With e-procurement transparency is enhanced within the entire system both in the employee's eyes and the provider's eyes (Croom & Johnston, 2003; Bartezzaghi & Ronchi, 2003).

Corini (2000) refers to a report by Deloitte Consulting in which controlling maverick spending was cited as a principal benefit of e-procurement. On the contrary, studies by Angeles and Nath (2007) found that implementing an e-procurement system did not necessarily eliminate the problem of maverick buying.

The use of e-procurement applications reduces human intervention and paperwork and often resulting in improved performance for buyers and suppliers (Melville, Kraemer & Gurbaxani, 2004; Sanders, 2005; Subramani, 2004). Figure 2.1 is showing the efficiencies generated from the adoption of e-procurement technologies.

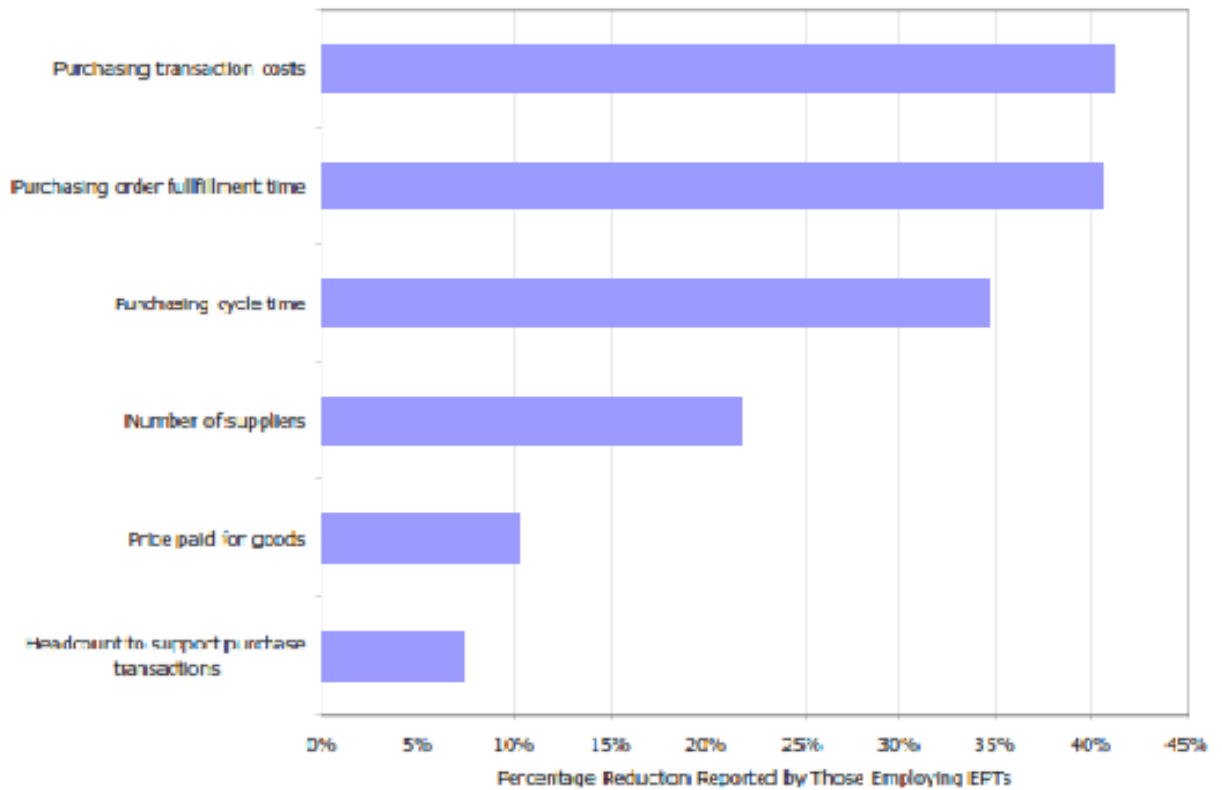


Figure 2.1: Efficiencies Generated from the Adoption of E-procurement Technologies

Source: Davila et al (2003) (p-15)

Afsharipur, Afshari and Tanzi, (2006) emphasises that to date more or less all studies on e-procurement report large efficiencies regarding process and procurement costs. They report the impact of e-procurement on enterprise compliance and spend management initiatives, referring to Aberdeen Group 2004 findings as in Table 2.3 below.

Table 2.3: E-procurement Impact (Average Performance)

Performance Area	Before e-procurement	After e-procurement
% of spending that is off contract (maverick)	38%	14.2%
Price savings on maverick purchases brought into compliance	-	7.3%
Requisition-to-order cycles	20.4 days	3.8 days
% of spend under management of the procurement group	56%	69%

Source: Aberdeen Group (2004)

Table 2.4 also summarises quantified benefits of e-procurement applications as quoted by various literature.

Table 2.4: Quantified benefits of e-procurement applications

Reference Quantified Benefits	Reference Quantified Benefits
Tatsis <i>et al.</i> (2006) refer to a European study conducted in year 2000,	Reduction in transaction costs of up to 90%, Lead-time reductions of up to 60% and Purchase prices reductions of up to 10%.
Tatsis <i>et al.</i> (2006) report another study, conducted among 14 companies of different sizes	Process cost reductions of 60–80%
<i>Davila et al.</i> (2003)	Purchasing transaction cost reductions of 42 % in, associated with less paperwork, which translates into fewer mistakes and a more efficient purchasing process
Miller (2006)	Reaping benefits often to the tune of millions of dollars Enjoying returns that may measure up to 300% of the initial investment in just 3 years”.
Mitchell (2007)	Between 5 % and 15% savings on indirect spending, with 8-month pay-back periods, hard savings coming primarily from volume discounts and reduced off-contract spending, as well as from implicit labour savings when the activity-based cost of a purchase is reduced from US\$75-150 to S\$10- 25.

Source: Bahreman (2010) (p-80)

Further, these prominent and quantified cost savings, the literature contains a collection of non-quantified classifications of benefits companies expect to see by automating the tactical processes and workflows associated with purchasing. These are summarized in Table 2.5.

Table 2.5: Non-quantified e-procurement benefits

Turban <i>et al.</i> (2006)	• Increased productivity of purchasing agents • Lower purchase prices of different types of goods and services • Better streamlining of information flow, business processes and workflows involved in purchasing • Eliminating maverick buying (i.e., buying from unauthorized buyers) • Reduced order fulfilment and processing times • Reduced number of suppliers the firm is dealing with • Better invoice reconciliation and dispute resolution • Reduced administrative processing cost per purchase order • Better integration of budgetary controls into the procurement process • Minimized human errors • Better monitoring and regulating buying behaviour
Angeles (2006), based on survey covering 185 firms	• Reduced paper-based transactions across the enterprise • Automation of some parts of the procurement process • Reduced cost of generating purchase orders • Reduced cycle time • Freed up procurement team for value added work • Staff focused on their primary duties • Quicker finding of purchase items • Improved order accuracy • Aggregate spending to achieve economies of scale • Better analysis and monitoring of global corporate spending • Increased control over supplier base and supplier prices • Gained control over off-contract buying • Reduced maverick buying • Promoted collaborative design/ development with suppliers • More favourable contracts negotiated • Simplified process of identifying new suppliers
Parida and Parida (2005), referring to ITRG InfoTech Research Group (2002)	• Increased process efficiencies leading to immense savings • Ability to link into existing systems, such as ERP • Reduced lead times within the procure-to-pay cycle, in some cases by 50% • Self-invoicing on behalf of clients • Streamlined business processes, common catalogue

	and month end reconciliations and increasing transaction accuracy • More engagement with strategic product management on the buyer side, leading to better contract negotiation • Reduced maverick spending • Inventory reductions leading to huge savings
Parida and Parida (2005), referring to Davila <i>et al.</i> , (2002) and Presutti (2002)	• Cost savings • Process efficiency • Better information flow between buyers and suppliers • Reduced maverick spending • Streamlined processes • Better inventory levels
U.N. E-Commerce and Development Report (2004)	• Reduction of prices through competitive bidding and transparent negotiation with suppliers • Reduction of bureaucracy, including “overheads”- money spent on administration of services rather than their delivery
Ghiya and Powers (2005), referring to the Intel’s indirect purchasing	• Reduced system architecture • Centralized procurement system attached to the communication backbone • Improved and standardized data models • Proven data architecture in use globally • Reduced IT operations management overhead • Scalability of core system components • Extensibility to other modules and third party applications • Visibility of data
Rehan (2006)	• Savings from reduction in the cost of ordering non-production goods • Reduction in cycle times • Increased customer satisfaction • Ensured streamlining of the procurement process and eliminated administrative overheads • Cross-business entity analysis for better contracts and pricing
Panayiotou <i>et al.</i> (2003)	• Improved control of vendor relationships • Accurate fulfilment of the processes • Improved effectiveness of the purchasing process • Achievement of higher service levels • Reduced prices from the key suppliers • Reduced inventory carrying cost

	• Reduction of the order cycle
Afsharipour <i>et al.</i> (2006)	• Price reduction • Improved contract compliance • Shortened Procurement cycle times • Reduced administration costs • Enhanced inventory management • Improved visibility of customer demand • Improved visibility of supply chain • Reduced operating & inventory costs • Increased accuracy of production capacity • Enhanced decision making • Improved market intelligence

Source: Bahreman (2010) (p-85)

2.7 Challenges towards adoption of e-procurement

Inhibiting factors to e-procurement have been expansively researched (Kheng & Al-Hawamdeh 2002, Min & Galle 2003, Tieman 2003; Angeles & Nath 2007). A study by Yen and Ng (2002) reported that there is some opposition to e-procurement from suppliers who may not achieve benefits from the cost of development and process change involved in adoption of buyers' systems. Similarly, Quayle (2005) reports that suppliers can be a barrier to implementation, if they are either unwilling to take part or are unclear of what is required of them.

Rehan (2006) mentions two basic challenges: First: Defining and integrating various processes and harmonizing operations between the organisations, suppliers and distributors. Secondly: Implementing a technology on top of existing enterprise systems that will work to bring the disparate systems and the new procurement software together to improve operations. Sallmann and Prorok (2001) accentuate that there is a growing number of decision makers who cannot cope with the technical development within public administrations because they lack specific expertise.

The rigid hierarchical culture in the public sector restricts the adoption of new technologies as was identified by Hawking et al. (2004). This is supported by MacManus (2002) who sees the structure of an organization as a major determining factor for the implementation and Moon (2005) who explains the late acceptance of new technologies

in public organizations with the predominantly formal structures. Lack of qualified employees is one of the barriers discussed in the study of Hawking et al (2004).

Research by ISM/Forrester Research, (2003) has also shown Small and Medium Enterprises (SMEs) lagging in the adoption of e-procurement and according to Harland, Caldwell, Powell, and Zheng (2007) the main reasons for this included owner attitudes, resource poverty, limited IT infrastructure and limited knowledge and expertise with information systems. Chen and Rankin (2006) mention the following four fundamental sources of challenges basing on their study on AEC (architecture-engineering construction) sector: Technological, Human, Financial and Environmental. Additionally, Afsharipur *et al.* (2006) talk about development cost, system integration, culture, development time and security as the five major impediments for e-procurement implementations.

Legal and administration procedures have been noted as key challenges in e-procurement adoption due to multiple legacy system, different data formats and complex processes (Subramaniam & Shaw 2002). Similarly, Scholl and Klischewski (2007), Aman and Kasimin (2011), identify that legal, policy, economic foundations and long-term funding are the main barriers in e-government project. Leipold (2004) and Daly and Buehner (2003) stated that the backing by executives and transform management are one of the most important factors and a barrier at the same time. The risk-averse attitude of the employees as a barrier of the implementation of e-procurement in public administration was established by (Kosilek, 2004).

Bartels (2004) suggests that getting suppliers to fully participate in and adopt e-procurement technologies is a major issue in implementation. Croom (2001) suggests that increased use of e-procurement creates more effective buyer–supplier relationships. This finding was repeated by White, Daniel and Wilkinson, (2004) who found that use of electronic marketplaces led to closer relationships with fewer suppliers. In the study by Carr and Smeltzer (2002), the use of information technology in supply chains did not necessarily increase trust. Croom and Brandon-Jones (2007) however, found that e-procurement transactions were more likely with suppliers who were well known and

trusted by the buying firm. A summary of these barriers, as identified in the literature is shown in Table 2.6.

Table 2.6: E-procurement Barriers Literature review

Factor	Reference
Security of transactions	Gebauer et al., 1998; PWC, 2002; Boston Consulting, 2002
Lack of Supplier E-procurement solution	PWC, 2002; Gebauer et al., 1998; Boston Consulting, 2002
High cost of technology	PWC, 2002
Lack of legal framework	PWC, 2002
Lack of technical expertise	PWC, 2002
Lack of E-procurement knowledge	PWC, 2002; Gebauer et al., 1998; Boston Consulting, 2002
No real business benefit identified	PWC, 2002; Gebauer et al., 1998; Boston Consulting, 2002
Data exchange standards lacking	PWC, 2002
Lack of business relationships with suppliers	PWC, 2002

Source: Hawking and Stein (2004) (p-102)

2.8 Models of E-procurement adoption

There are many models used in Information System (IS) research (Wade 2009). Although many models have been proposed to explain and envisage the use of a system, the Technology Acceptance Model (TAM) has been the only one which has captured the most attention of the Information Systems community. However, TOE Framework which has emerged as a useful theoretical lens for understanding technology adoption has been mostly used in the context of e-business. Past research on IT innovation adoption and diffusion has long converged on analyzing a core set of theoretical models. Kamal (2006) has identified various information technology adoption models from the research conducted in the recent past, presented in Appendix D.

Tornatzky and Fleischer (1990) developed a framework that explains the decision to adopt a technological innovation by a firm is not only based on the technological consideration, but also dependent on the organizational and environmental contexts. They summed up the findings of their study as TOE framework, which has been extensively used by researchers to study technology adoption.

The technological context describes the existing technologies in use and new technologies available to the organization. The organizational context describes some of the organizational characteristics and resources such as the organizational readiness, top management championship, and other factors relevant to organizational context. The environmental context consists of the environmental characteristics in which the organization conducts their services.

2.9 Gaps in Literature

Most E-procurement research studies place technology and applications centre stage focusing on the adoption and implementation of specific technology solutions. According to Schoenherr and Tummala, (2007), analysis of e-procurement literature since 1997 has established only 13% having been conducted on the general public sector. Table 2.7 below shows this summary.

Table 2.7: An analysis of services researched

Sector	%	Sector	%
None	32	Service	4
Multiple	15	Logistics	3
Manufacturing	14	Construction	3
Government	13	Libraries	2
Health care	5	Other	4
Retail	5		

Source: Mconnell (2009) (p-8)

Additionally, most of these studies focused mainly on large economies and technology-oriented industries (Tatsis, Mena, Wassenhove & Whicker, 2006). In addition previous studies have focused on private sector Angeles and Nath (2007). Initial efforts from academics have been devoted to studying assimilation mostly in e-business area

(Zhu, Kramer & Xu, 2003). This study therefore tried to expand the knowledge frontier to public sector research area in the Kenya Public Sector.

2.9.1 Conceptual framework

The reviewed literature and the TOE model guided the formulation of the conceptual framework. Figure 2.3 below shows the conceptual framework:

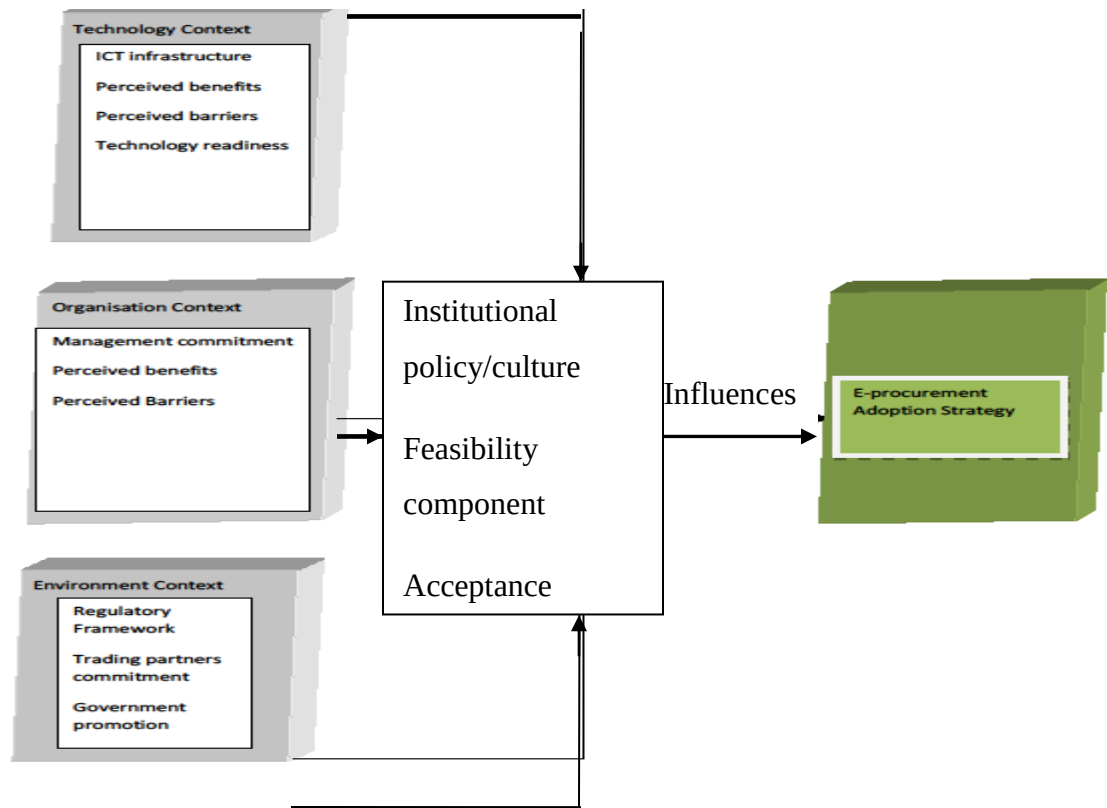


Figure 2.2: Research Conceptual Framework

The popularity of the internet has drastically influenced organizations' intentions to use new inter-organizational systems technologies such as e-Procurement. This study proposes a conceptual framework for exploring the adoption of e-procurement in the Kenya public sector. The TOE theoretical framework as described in section 1.1.5 has been used to come up with the conceptual framework for this study and will be used to guide the conduct of this study.

The TOE framework was analysed the variables of technology, organisation and environment. As illustrated in Figure 2.3 e-procurement adoption strategy is the dependent variable, while technology, organisation and environment factors form the independent variables. The technological factors that influence adoption strategy of e-procurement are ICT infrastructure, perceived barriers, perceived benefits and technology readiness. The organisation factors that influence e-procurement adoption strategies are financial resources, management commitment, perceived benefits and barriers. While regulatory framework, trading partners commitment and government commitment are the factors that affect the environmental context.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The core concepts underlying all forms of research are their methodologies (Angell, 2004). This chapter presents the methodology that was used to conduct the study. It covers the research design, the target population, sampling design, data collection instruments and procedures, the method of data analysis, research quality, and ethical considerations while conducting the research.

3.2 Research Design

Research design is the blueprint that enables the investigator to come up with solutions to problems and guides him in the various stages of the research (Nachamias & Nachamias, 2004). Cooper and Schindler (2003) state a broad research design consists of diverse elements such as the type of research design focus, time dimension and conditions. This research adopted a descriptive based approach design with the primary data collected using questionnaires, personal interviews. Descriptive choice is based on the argument by Kathuri and Pals (1993) explores the relationship between variables and entails making careful description of the phenomenon (Borg & Gall, 1993).

3.3 Population and Sampling

Mugenda and Mugenda (2003) define population as a complete set of individuals, cases or objects with some common observable characteristics. Dencombe (2007) defines a population frame as an objective list of the population from which the researcher can make his or her selection. A population can be described as the entire compilation of elements that the researcher aspires to draw conclusion from (Cooper & Schindler 2003). Web (2002) points out that a population or universe is the aggregate of all the elements.

Table 3.1 presents the target population. The population of interest (Appendix C) was drawn from the forty two government ministries in Kenya and consisted of the staffs of procurement and ICT. The underlying assumption of the key informant approach is that the person, by virtue of his/her position in the organisation hierarchy, is able to provide opinions and perceptions that are valid reflections of those of other key decision makers

in the firm (Li & Atuahene-Gima, 2002). Also cases of the subjects were handpicked because they possess the required characteristics (Mugenda & Mugenda, 2003).

Table 3.1: Target Population

	Procurement officers	ICT officers
Government Ministries (HQs)	42	42
Total	42	42

3.3.1 Sampling design

Sampling design refers to a research plan that indicates how cases are to be selected for observation or as respondents (Mugenda & Mugenda, 2003). According to Schmidt and Hollensen (2006) sampling involves the identification of a group of individuals or households who can be reached by mail, by telephone or in person and who possess information relevant to solving the marketing problem at hand.

The sample size is determined by both statistical and practical considerations (Jarboe, 1999). This study made use of non-probability sampling method (purposive and convenience) and the sample size was determined by practical concerns such as resources in terms of money, time and respondents available. Tustin et al (2005) state that, statistical calculations of sample sizes can only be done for probability sampling methods as there is no statistical formula for prior calculation of the size of a non-probability sample. The sample of this study was 50% of the total population and the study covered a total population of 84 (42 procurement heads and 42 ICT heads) staffs drawn from the various ministries as identified in Appendix C. Therefore, a sample of 42 officers was engaged in the study. Table 3.2 below presents the sample size.

Table 3.2: Sample Size

Government Ministries (HQs)	Population	Sample proportion	Sample size
Procurement officers	42	0.5	21
ICT officers	42	0.5	21
Total	84	1.0	42

3.4 Data Collection Methods

The study sought primary and secondary data. Primary data was majorly quantitative in nature collected through a semi-structured questionnaire, with open-ended questions to give respondents freedom to express their own opinions. More qualitative data was collected through the use of a structure interview guide as presented in Appendix B.

McDaniel and Gates (2001) define a questionnaire as a set of questions designed to generate the data necessary to accomplish the objectives of the research project. It is guided by the research questions and serves as a data collection tool (Punch, 2003). Lamb et al (2004) state that by arranging the questions logically and observing other sequencing rules, the researcher enhances the standard of the interview, helps the interviewer and induces a logical flow through the questions. Likert scale closed ended questions were used to solicit ideas which were designed to give a brief introduction of public procurement. The questionnaires were divided into sections representing the various variables adopted for the study.

The questionnaire was administered through drop and pick method to the officers of the selected ministries. The authority to conduct the study from the targeted population was obtained from the top level management through a letter of introduction from the University (Strathmore).

3.5 Data Analysis and Presentation

Munro (2005) describes analysis as the statistical and qualitative consideration of data gathered by research. Zikmund and D'Amico (2001) define analysis as the statistical and qualitative consideration of data gathered by research. According to Yin (1994), data analysis involves examining, categorising, tabulating or otherwise recombining the collected data. This included analysis of data to summarize the essential features and relationships of data in order to generalize from the analysis to determine patterns of behaviour and particular outcomes. Data analysis was carried out in two parts; descriptive analysis and inferential statistical analysis. Descriptive deals with method of organising, summarising and presenting data in an informative way (Keller, 2001). Before processing the responses, the completed questionnaires were edited for completeness and consistency. Data was grouped into frequency distribution to indicate variable values and

number of occurrences in terms of frequency. Frequency distribution tables are informative to summarize the data from respondents, percentages and other diagrams such as bar charts, histogram, grouped frequency distributions and pie charts were used during the analysis. The organized data was interpreted on account of concurrence, mean and standard deviation to objectives using assistance of computer packages especially Statistical Package for Social Sciences (SPSS V19) which offers extensive data handling capability and numerous statistical analysis routines that can analyse small to very large data statistics (Ming-Ling, 2008) and Microsoft Excel. The study also used Pearson Product Moment Correlations and a regression model to establish the relationship between the independent (drivers of e-procurement, e-procurement readiness and e-procurement strategies) and the dependent variable (e-procurement adoption strategy in the Kenya public sector).

3.6 Research Quality

The four facet of research quality which include; validity, reliability, objectivity and subjectivity were considered during the study process.

3.6.1 Reliability

Reliability measures the accuracy and precision of the tool; thus an index that registers the extent to which measured data is free from random error (Cooper & Schindler, 2003). According to Louise, Jung and Widmark (2004) a good reliable research is if any person uses the same methods at another time and sample for investigating the same subject would get the same results. Various tactics were employed to establish reliability of the study, as recommended by Yin (1994) and Herzog (1996). First, as many steps of the research as possible were documented. Second, a formal and presentable database of interviews and documents were prepared. Third, the researcher was the only interviewer, enabling this activity to be consistently performed across cases. Fourth, this research adhered to the four aspects that Yin (1994) described in how to establish a chain of evidence, further increasing the reliability of the study. Also, reliability in this study was improved in two more ways; One: only experts in the field of ICT were interviewed; two: the interviews were administered by only one researcher. This was to ensure consistency in the results produced.

3.6.2 Validity

Validity refers to the accuracy of the tool actually measuring what it is supposed to measure and to the extent to which a particular measure is free from systematic and random errors (Diamantopoulous & Schlegelimilch, 2000). Researchers can also validate findings if they are supported by other studies (Sarantakos, 2005). Validity for this data was guaranteed through triangulation of data collection methods (questionnaire, and interviews). Content validity was also conducted whereby previous studies in literature review were also conducted to validate the findings.

3.6.3 Objectivity

Objectivity generally requires that the findings are free from bias (Silverman, 2000). This study achieved this by choosing relevant methods for data collection and designing collection tools which eliminated researcher bias.

3.6.4 Subjectivity

Leedy and Ormrod (2001) describes subjectivity as a research principle that refers to the extent the researcher's personal impressions, feeling, assumptions, beliefs and opinions influences their judgement. The researcher being aware of this aspect ensured that this was minimised in the study through the method selected in the data collection.

3.7 Ethical Considerations

In "Building a Successful E-Govt Strategy," Robb (2001, p. 48) argues that policies and procedures must be established prior to implementation to: protect the privacy of personal data, determine the amount and types of information to make available to the public, protect data, dictate data access, and establish penalties for lapses of security. Security rules and procedures, often limiting the public and the press's right to know, appear to some to be counter to the principle of "government in the sunshine".

In order to cover ethical issues in this study, the researcher provided a covering letter to the respondents to accompany the questionnaire that was used in the data gathering. The letter states that the information and data gathered will be used solely for academic purposes and that no individual/firm will be will be identifiable. This is important as the organisations might be in competition or certain information may be privilege. This also

assisted in easing the purpose of the study. Further, the information will remain absolutely confidential and purely for academic purposes. Additionally, it was optional to all the respondents to identify themselves, and their organisations anywhere in the questionnaire and the interview.

3.8 Limitations

The study was limited to only Kenya government ministries, specifically those located within Nairobi city. However, the findings are applicable to all government ministries in the whole country. There was none co-operation from some of the respondents among the target group.

CHAPTER FOUR

PRESENTATION OF RESEARCH FINDINGS

4.1 Introduction

This chapter presents the results of the study. The results from the interviews and questionnaires have been presented. The study targeted a population of 42 ministries that currently exists in the Kenya public sector. Descriptive statistics in form of frequencies, percentages and mean scores were used to determine the pattern of data from the variables.

4.2 Analysis of the Respondents' Demographics and response rate

The respondents were required to provide some general background information about their age, level of education, job experience, and number of years they used ICT infrastructure for procurement purpose. The study achieved a response rate of 68.29%, with 27 questionnaires being returned out of the 42 that had been distributed. This represented a significant response rate. According to Zikmund (2003), a response rate is significant if it exceeds 20%, hereby implying that the data can be relied upon to draw up conclusions. Further, the study revealed that 55.56% of the respondents were drawn from the ICT department thus representing a 71.43% response from the department while the remaining 44.44% were drawn from the procurement department, representing a 57.14% response from the department.

4.2.1 Age of the Respondents

The researcher sought to find out the age brackets of the respondents. As shown in Figure 4.1, no respondents were either less than 21 years old or above 55 years. As shown, however, 8% of the respondents were aged between 21 and 25 years; 22% were aged between 26 and 30 years; another 21% of the respondents were aged between 31 and 35 years; 12% were aged between 36 and 40 years; 8% were aged between 41 and 45 years; 17% were between 46 and 50 years; and the remaining 12% were aged between 51 and 55 years. With a combined 63% of the respondents below 40 years, the results imply that most of the employees in the procurement department are youthful and therefore can easily accept technological adoption at their work place.

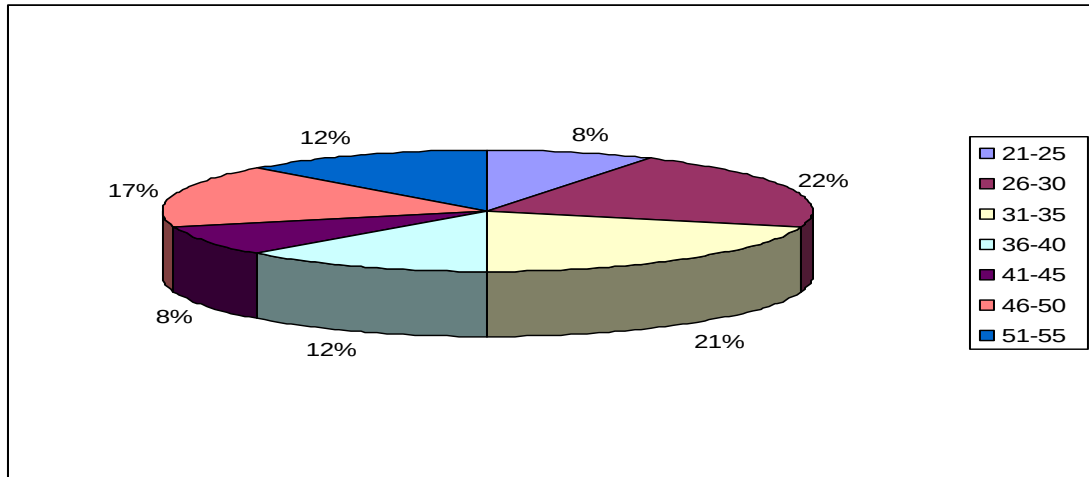


Figure 4.1: Age of the Respondents

4.2.2 Respondents' Education Level

Education is one of the most important characteristics that might affect the person's attitudes and the way of looking and understanding any particular phenomena. In a way, the response of an individual is likely to be determined by his educational status and therefore it becomes imperative to know the educational background of the respondents. As shown in Figure 4.2, 17% of the respondents had attained college certificates, 42% had attained college diploma certificates and 41% had university degrees. This indicates that majority of the respondents (83%) had attained a tertiary level of education. Therefore, if education level relates to professionalism then one can assume that the information provided is valid and reliable information.

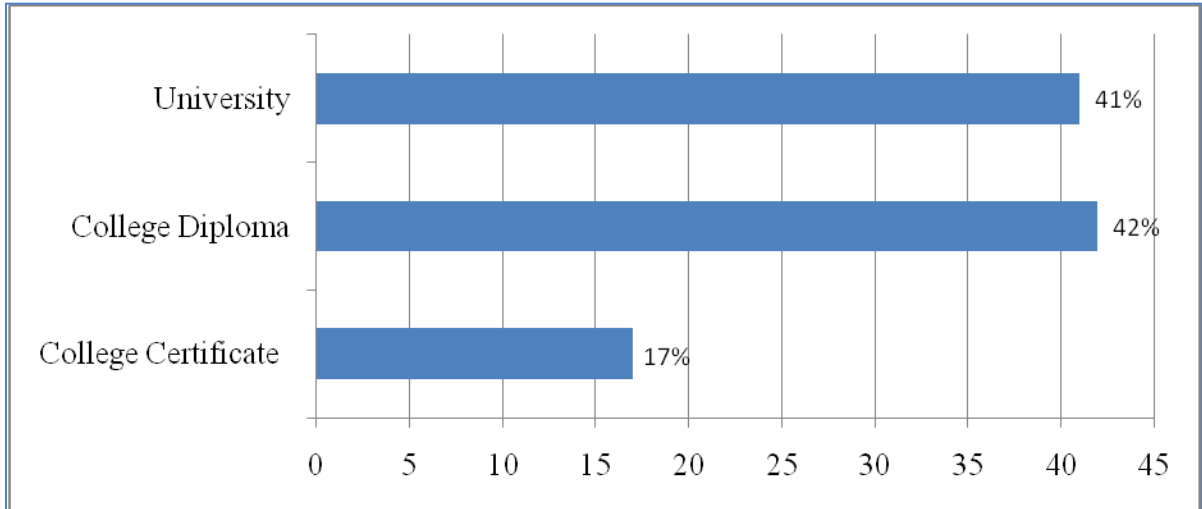


Figure 4.2: Educational Levels of the Respondents

4.2.3 Respondents' Experience

The researcher sought to find out the respondents experience. The results (Figure 4.3) indicated that 3.70% of the respondents have been in their current positions for less than one year; 11.11% for between 1 and 5 years; 14.81% between 6 and 10 years; 29.63% between 11 and 15 years; while the remaining 40.74% of the respondents had worked in their current positions for more than 15 years. This shows that 77.77% of the respondents had over 10 years of experience in their department and are thus able to produce replicable results. This shows the majority are experienced and well exposed and are able to give accurate information.

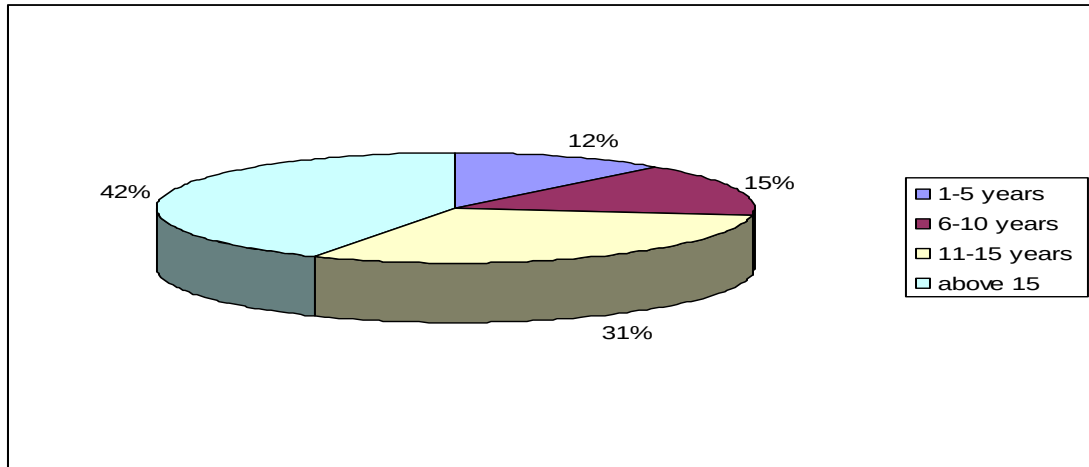


Figure 4.3: Experience of the Respondents in their Current Positions

4.2.4 Approaches used in the Adoption of E-procurement

The respondents were asked to indicate the approaches used in the adoption of e-procurement. The results revealed that 40.74% of the ministries use the slow step-by-step adoption where implementation is one piece of the system at a time and slowly brings trading partners on board; 33.33% use the total replacement model where a totally parallel system is built, tested, then switch over to it when it works; while the remaining 25.93% of the ministries use a parallel model as shown in Figure 4.4. No ministry uses more than one approach simultaneously.

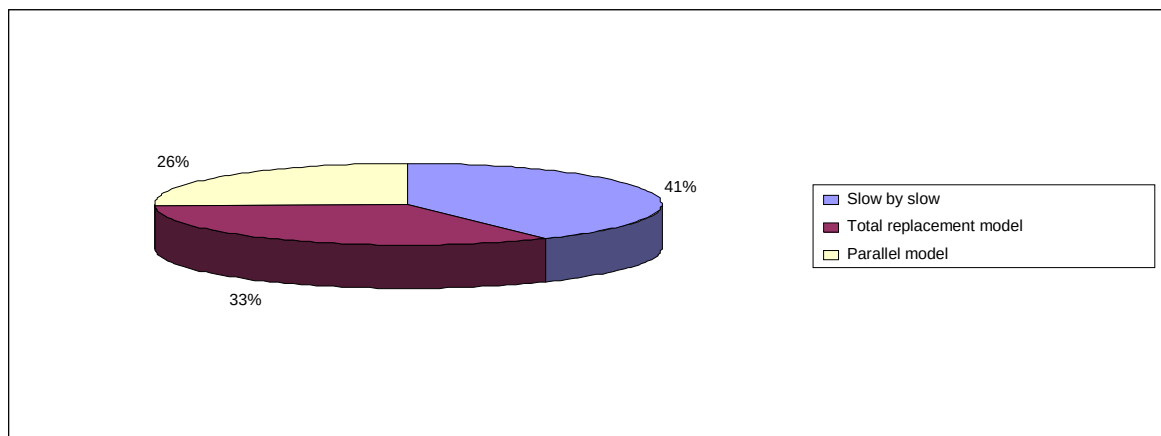


Figure 4.4: Approaches used in the Adoption of E-procurement

4.2.5 Adequacy of Adoption Strategies

The respondents were asked to indicate the adequacy of the strategies in place in the adoption of e-procurement within their parent ministries. The results indicate (Figure 4.5), 25.93% of the respondents strongly agreed that the strategies in place were adequate, a majority 55.56% agreed that they were adequate, while the remaining 18.51% of the respondents disagreed that the strategies were adequate. With a combined 81.49% of the respondents agreeing that the strategies are adequate, it so implies that most ministries are well set to adapt to the new and on-going changes.

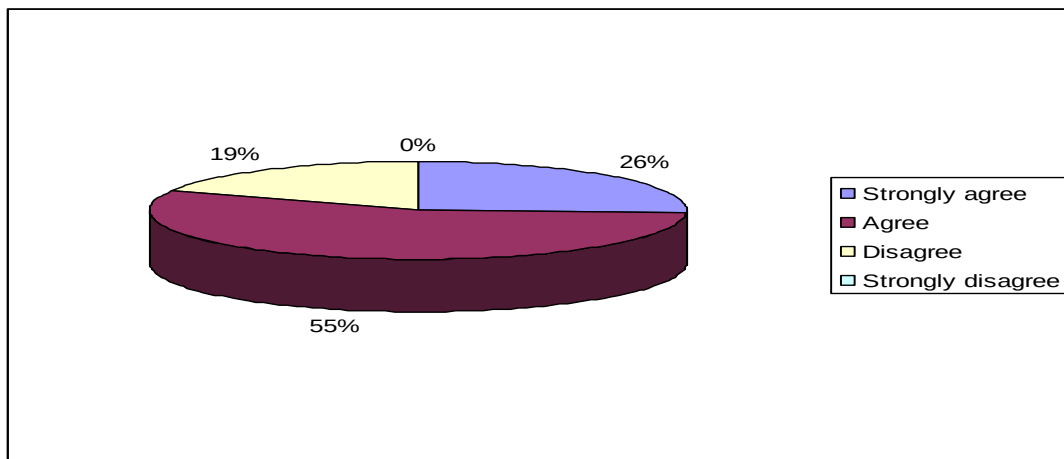


Figure 4.5: Adequacy of Adoption Strategies

The respondents were asked to indicate on what the decision to adopt e-procurement was based. The results revealed that the decision to adopt e-procurement is based on internal requirements according to 77.78% of the respondents, external requirements according to 92.59% of the respondents and both internal and external requirements according to 66.67% of the respondents. The main internal driver to the e-procurement adoption was improving transparency while at the same time checking on the effectiveness and efficiency of the process to reduce procurement costs, while the major external driving force was legislation to comply with government standards.

4.3 Procurement in the Kenyan Public Sector

The study sought to establish the ministries that have established and adopted an e-procurement system in its procurement activities and the results revealed that 100% of the ministries that were sampled had adopted e-procurement or were in the process of adopting one form or another in its operations. Further, 85.19% of the respondents indicated that their parent ministries have an e-procurement policy while 14.81% of the respondents indicated that such a policy does not exist in their ministries. Given that e-procurement has not been around for long, it is only fair that ministries be given time to fully adopt it, implying that those ministries that might not have such a system in place should be in the process of complying.

4.3.1 E-procurement Policy Ministries-wise

The researcher sought to find out the level of adoption of e-procurement policy in the various ministries. The results (Figure 4.6) indicated that 11.11% of the respondents rated the e-procurement policy in their ministry as strongly favourable; the majority 59.26% rated the e-procurement policy in their ministry as favourable; 25.93% rated it as uncertain; while a paltry 3.70% rate the e-procurement policy as unfavourable. No respondent rated the policy as strongly unfavourable. This shows that the transition from the traditional manual procurement to an e-procurement system has been well documented and prepared for with the implementation procedures being clearly stated and a precise definition of the objectives of such a move.

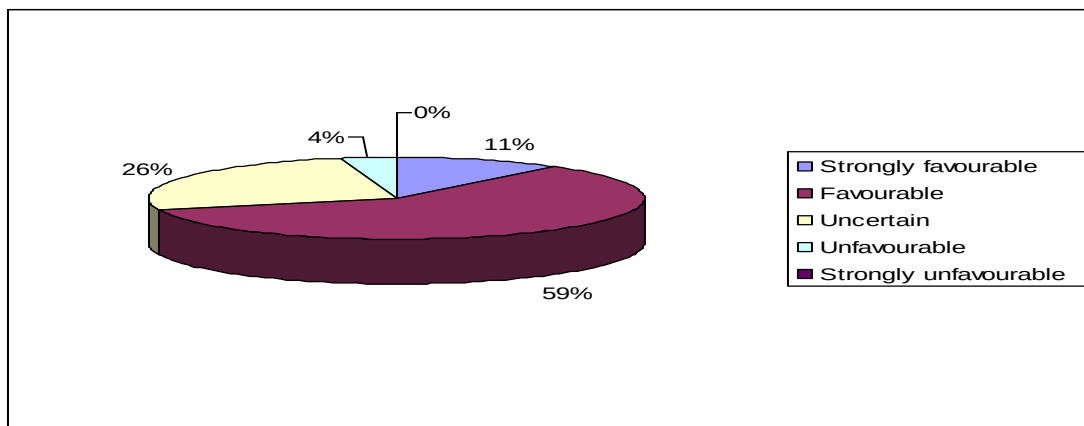


Figure 4.6: Rating the E-procurement Policy in Different Ministries

4.3.2 Level of e-procurement adoption

The researcher sought to investigate the level to which the sampled ministries had adopted e-procurement practices. The level of adoption of e-procurement in various ministries is very high (22.22%); high according to 29.63% of the respondents; low according to 37.04% of the respondents and very low according to 11.11% of the respondents as shown in Figure 4.7. The results imply that some ministries have successfully adopted e-procurement while others are still in the process of adopting to it, with some at advanced stages and others at the beginning stages.

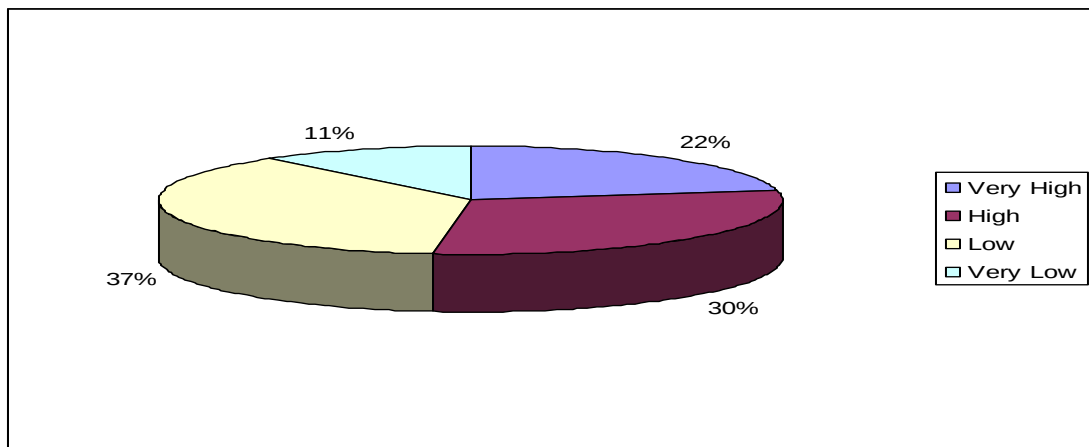


Figure 4.7: Level of Adoption of E-procurement within various Ministries

4.3.3 Types of E-Procurement used in Government Ministries

The respondents were asked to indicate the type of e-procurement used. The mostly used types of e-procurement as reported by the respondents are e-sourcing as supported by 34% of the respondents, e-tendering (39%) and e-informing, which was supported by 27% of the respondents, making it the least used type. It was noted, however that the ministries used a combination of all the three types of e-procurement simultaneously as they are all part of the system, as shown in Figure 4.8.

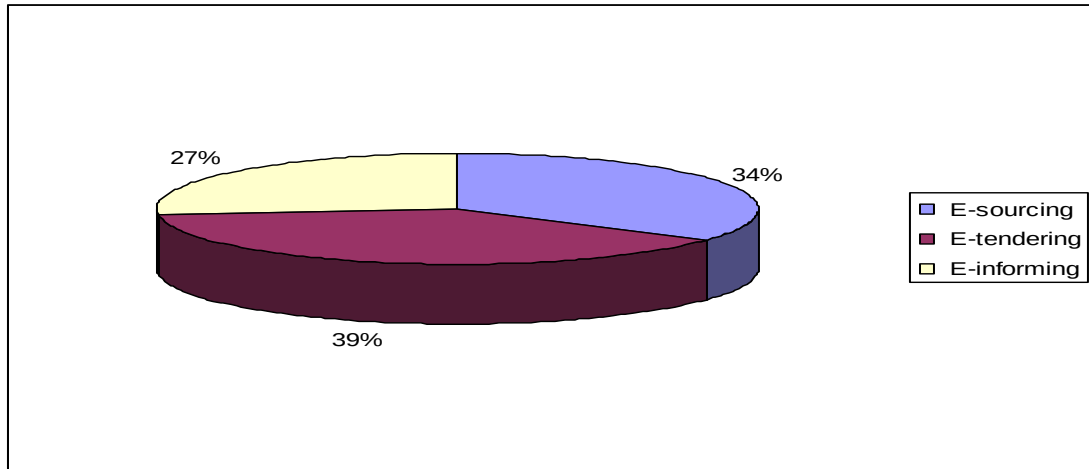


Figure 4.8: Types of E-Procurement used in Government Ministries

4.3.4 Extent of E-Procurement System Incidence Adoption

The respondents were asked to indicate the extent to which the Incidence of E-Procurement System Adoption in their parent ministries on a scale of 1 to 4 where 1 is to a very little extent; 2 to a little extent; 3 to a large extent and 4 to a very large extent. A mean of between 3.01 and 4.00 implies a very large extent; a mean of between 2.01 and 3.00 shows a large extent; a mean of between 1.01 and 2.00 implies a little extent, while a mean that is less than or equal to 1 indicates a very little extent. Additionally, a standard deviation that is less than 1.00 indicates that the observations are closely spread around the mean and are therefore insignificant while a standard deviation that is more than 1.00 indicates a significant scatter of observations from the mean.

Table 4.1: Extent of E-Procurement System Incidence Adoption

System Incidence	4	3	2	1	Mean	Std Dev
E-mail	44.44%	48.15%	7.41%	-	3.37	0.63
Websites	85.19%	14.81%	-	-	3.85	0.36
Funds transfer	29.63%	25.93%	33.33%	11.11%	2.74	1.00
Electronic data interchange	-	11.11%	62.96%	25.93%	1.85	0.60
MS Outlook	70.37%	22.22%	7.41%	-	3.63	0.63
Knowledge sharing	81.48%	18.52%	-	-	3.81	0.40
E-procurement	96.30%	3.70%	-	-	3.96	0.19
Intranet	100.00%	-	-	-	4.00	0.00
Portals	77.78%	22.22%	-	-	3.78	0.42
Global positioning systems	-	-	14.81%	85.19%	1.15	0.36

As shown in Table 4.1, the most widely used system incidence within the ministries is intranet with a mean of 4.00 and a standard deviation of 0.00, implying wide usage of the tool. It could aid in the switch to a new systems as a facilitator of change. Other system incidences used to a very large extent include e-mail mean (μ) of 3.37 and standard deviation (σ) of 0.63; websites μ of 3.85 and a σ of 0.36; Ms Outlook ($\mu=3.63$; $\sigma=0.63$); knowledge sharing ($\mu=3.81$; $\sigma=0.40$); e-procurement ($\mu=3.96$; $\sigma=0.19$); and portals ($\mu=3.78$; $\sigma=0.36$). These results show that there is a high level use of ICT services within the ministries that can enhance the adoption of e-procurement.

Funds transfer is used to a large extent with a mean of 2.74 and a standard deviation of 1.00 while global positioning systems are used to a little extent with a mean of 1.15 and a standard deviation of 0.36.

4.3.5 Online Procurement and Procurement Methods

The respondents were also required to indicate whether their ministry procures online using the procurement methods that were provided including open tenders, restricted tenders, requests for proposal, requests for quotation, direct procurement, and low level procurement. The results (Table 4.2) revealed that open tenders and request for quotations are used in most ministries very often with means of 4.37 and 4.41 respectively. Restricted tenders (2.37) and request for proposals (2.37) are used sometimes. With means of 1.19 and 1.07 respectively, direct procurement and low level procurement are both used rarely as presented.

Table 4.2: Online Procurement and Procurement Methods

Online procurement and procurement methods	Never	Rarely	Sometimes	Often	Very Often	Mean	Std dev
Open tender	-	-	14.81%	33.33%	51.85%	4.37	0.74
Restricted tender	-	62.96%	37.04%	-	-	2.37	0.49
Request for proposals	-	70.37%	22.22%	7.41%	-	2.37	0.63
Request for quotation	-	-	11.11%	37.04%	51.85%	4.41	0.69
Direct procurement	81.48%	18.52%	-	-	-	1.19	0.40
Low level procurement	92.59%	7.41%	-	-	-	1.07	0.27

4.3.6 Adoption of e-procurement importance

Adoption of E-Procurement is important and the respondents were asked to indicate, on a scale of 1 to 4, how the adoption of e-procurement has been of importance under such as

price reduction, improved contract compliance, shortened procurement cycle times, reduced administration costs, enhanced inventory management, improved visibility of customer demand, reduced operating & inventory costs, increased accuracy of production capacity, enhanced decision making, and improved market efficiency. The results (Table 4.3) showed that adoption to e-procurement is used to a very large extent in all the ministries to shorten procurement cycle times and to improve market efficiency, both of which had means of 4.00 respectively. Further, adoption of e-procurement is used to a very large extent to reduce prices (3.52); improved contract performance (3.74); enhanced inventory management (3.15); reduced operating & inventory costs (3.59); increased accuracy of production capacity (3.78); and enhanced decision making with a mean of 3.89.

Moreover, e-procurement is used to a little extent for improved visibility of customer demand with a mean of 2.00 since this is a function of the private sector. All the observations had standard deviations that were less than 1.00 showing that they were closely spread about the mean. Overall, the results indicate that e-procurement in the public sector plays an important role in cost reduction and more efficiency and operational effectiveness.

Table 4.3: Importance of Adoption of E-procurement

Important aspect	4	3	2	1	Mean	Std Dev
Price reduction	62.96%	25.93%	11.11%	-	3.52	0.70
Improved contract compliance	74.07%	25.93%	-	-	3.74	0.45
Shortened Procurement cycle times	100%	-	-	-	4.00	0.00
Enhanced inventory management	37.04%	44.44%	14.81%	3.70%	3.15	0.82
Improved visibility of customer demand	-	22.22%	55.56%	22.22 %	2.00	0.68
Reduced operating & inventory costs	70.37%	18.52%	11.11%	-	3.59	0.69
Increased accuracy of production capacity	81.48%	14.81%	3.70%	-	3.78	0.51
Enhanced decision making	88.89%	7.41%	3.70%	-	3.85	0.46
Improved market intelligence	100.00 %	-	-	-	4.00	0.00

4.3.7 Barriers to e-procurement adoption

The full implementation of the adoption of e-procurement has been limited by various barriers. The study established that lack of technical expertise with a mean of 3.41 and the lack of a legal framework with a mean of 3.74 limit full implementation of e-procurement to a very large extent. E-procurement being a new organisational phenomenon lacks enough qualified personnel, and at the same time, the legislation in place may be weak to support infrastructure for full implementation of e-procurement. At the same time, there is lack of data exchange (3.52) which also limits full implementation of e-procurement to a very large extent.

Security of transactions (2.15); high cost of technology (2.81); and lack of e-procurement knowledge (2.59) limit the adoption and full implementation of e-procurement to a large extent; while barriers such as lack of supplier e-procurement system (1.59), lack of business relationships with suppliers (1.81) and no real business benefit identified (1.00) limit full implementation to a very little or to a little extent as shown in Table 4.4.

Table 4.4: Barriers to the Full Implementation of E-Procurement

Barrier	4	3	2	1	Mean	Std Dev
Security of transactions	11.11%	25.93%	33.33%	29.63%	2.15	1.03
Lack of Supplier E-procurement solution	-	-	59.26%	40.74%	1.59	0.50
High cost of technology	25.93%	37.04%	29.63%	7.41%	2.81	0.92
Lack of legal framework	77.78%	18.52%	3.70%	-	3.74	0.53
Lack of technical expertise	55.56%	29.63%	14.81%	-	3.41	0.75
Lack of E-procurement knowledge	18.52%	33.33%	37.04%	11.11%	2.59	0.93
No real business benefit identified	-	-	-	100%	1.00	0.00
Data exchange standards lacking	62.96%	25.93%	11.11%	-	3.52	0.70
Lack of business relationships with suppliers	-	18.52%	44.44%	37.04%	1.81	0.74

4.3.8 Frequency of Online Procurement Tasks

The respondents were asked to indicate, on a scale of 1 to 4 how often their parent ministries carry out various tasks online, where 4 is very often, 3 is often, 2 is to rarely and 1 is to never. Two procurement tasks are used very often, i.e. awarding online (3.33) and electronic invoicing (3.04). Electronic contracting (2.48) and online procuring (2.22) are used often, while online bidding (1.74); electronic payments (1.54); electronic posting of bids (1.15); receiving formal bids electronically (1.26); and transmitting of PO electronically (1.04) are rarely used. With a mean of 1.00, vendor selection is never done electronically. The results are as shown in Table 4.5.

Table 4.5: Frequency of Online Procurement Tasks

Procurement tasks	Never	Rarely	Often	Very Often	Mean	Std Dev
Awarding Online	-	-	66.67%	33.33%	3.33	0.48
Bidding Online	44.44%	37.04%	18.52%	-	1.74	0.76
Contracting done electronically	-	59.26%	33.33%	7.41%	2.48	0.64
Invoicing done electronically	-	25.93%	40.74%	29.63%	3.04	0.77
Make payments electronically	55.56%	33.33%	11.11%	-	1.56	0.70
Posts bid results electronically	88.89%	7.41%	3.70%	-	1.15	0.46
Procuring Online	18.52%	40.74%	40.74%	-	2.22	0.75
Receive formal bids electronically	74.07%	25.93%	-	-	1.26	0.45
Transmit PO electronically	96.30%	3.70%	-	-	1.04	0.19
Vendor selection done electronically	100%	-	-	-	1.00	0.00

4.4 Drivers of E-procurement in the Kenya Public Sector

The results (Table 4.6) indicate that the most important drivers in the adoption and implementation of e-procurement include process cost savings with a mean of 3.74, which is used at the tender/ purchase process; service/material/product cost savings with

a mean of 3.93; enhanced inventory management (3.93); shortened overall procurement cycle times (4.00); increased quality through benchmarking (market intelligence) with a mean of 3.11; and increased quality through increased competition (3.96). Other drivers used that are important in the adoption of e-procurement are transaction administration cost savings with a mean of 2.52 and a significant standard deviation of 1.01; decrease in costs through reduced staffing levels with a mean of 2.22; while reduction in evaluation time with a mean of 1.66 drives the adoption of e-procurement to a little extent.

Table 4.6: Drivers used in the Adoption of E-procurement

Driver	4	3	2	1	Mean	Std Dev
Process cost savings - (Tender / Purchase Process)	81.48%	11.11%	7.41%	-	3.74	0.59
Service / Material / Product Cost Savings	92.59%	7.41%	-	-	3.93	0.27
Transaction Administration Cost Savings	14.81%	44.44%	18.52%	22.22%	2.52	1.01
Enhanced Inventory Management	92.59%	7.41%	-	-	3.93	0.27
Decrease in Costs through reduced staffing levels	3.70%	25.93%	59.26%	11.11%	2.22	0.70
Shortened Overall Procurement Cycle Times	100%	-	-	-	4.00	0.00
Reduction in Evaluation Time	-	7.41%	55.56%	33.33%	1.66	0.61
Increased Quality through Benchmarking (Market Intelligence)	40.74%	40.74%	7.41%	11.11%	3.11	0.97
Increased Quality through increased competition	96.30%	3.70%	-	-	3.96	0.19

4.5 E-procurement Readiness in the Kenya Public Sector

The respondents were asked to indicate the e-readiness in the Kenya public sector. As shown in Figure 4.9, 74.07% of the respondents indicated that the public sector in Kenya is ready for a paradigm shift to e-procurement while the remaining 25.93% of the respondents agreed implying that all the ministries studied had accepted the change from the traditional procurement procedures to electronic procurement.

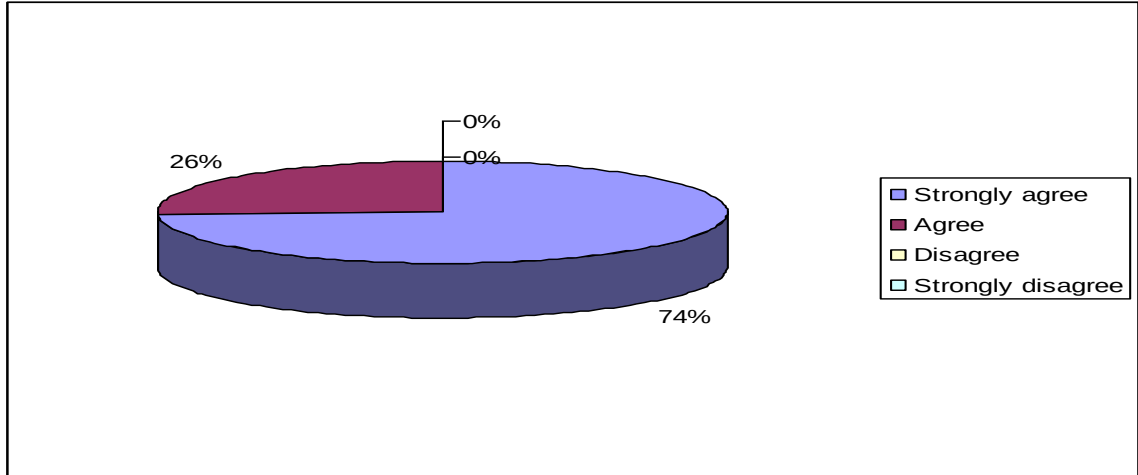


Figure 4.9: Readiness of Ministries' Shift to E-Procurement

4.5.1 Capacity for the Adoption of E-Procurement

The respondents were asked to indicate the capacity, on a scale of 1 to 4, which the government ministries in Kenya have in readiness for a full shift to an e-procurement system. As shown in Table 4.7, the government has braced itself enough for the change since all the capacity areas have been addressed to a very large extent including institutional capacity- governance leadership, HR Management (3.22); governance-planning & management; legislation & regulation (3.07); business functionality and standards – infrastructure and web services; and standards (3.56); private sector involvement – private sector integration (3.74); and application of technology through systems (3.85). This implies that the government has enough supporting capacity for the adoption of e-procurement.

Table 4.7: Capacity for the Adoption of E-Procurement

Capacity	4	3	2	1	Mean	Std Dev
Institutional capacity- governance leadership, HR Management	48.15%	29.63%	18.52%	3.70%	3.22	0.89
Governance-planning & management; legislation & regulation	33.33%	40.74%	25.93%	-	3.07	0.78
Business functionality and standards – infrastructure and web services; and standards	62.96%	29.63%	7.41%	-	3.56	0.64
Private sector involvement – private sector integration	77.78%	18.52%	3.70%	-	3.74	0.53
Application of technology through systems	85.19%	14.81%	-	-	3.85	0.36

The respondents felt that the most important capacity improvement area is the application of technology through systems followed by private sector integration, then business functionality and standards followed by governance leadership and finally legislation and regulation.

The respondents were additionally asked to indicate their extent of agreement with issues about e- readiness in their ministry procurement structures. The respondents strongly agreed with the following statements: there is lack of knowledge about e-procurement adoption (3.26); E-procurement creates the best way to purchase (3.59); there is concern over security of data (3.89); human infrastructure is ready (3.37); leadership and strategic

thinking is ready (3.11); and that e-procurement provides opportunities for hackers to paralyze firm operations (3.56). The respondents further agreed that it is expensive to implement to e-procurement (2.56); data systems infrastructure-is ready (2.59); management systems, records and work processes is in place (2.70); and the organisation is ready for uptake of e-procurement (2.67).

4.5.2 Readiness to E-Procurement System

The respondents were asked e-procurement readiness. The respondents disagreed that staffs within the ministry are sufficiently ICT literate to support the introduction of e-procurement (1.44); benefits of e-procurement adoption are not good enough (1.81); it is complex to adopt e-procurement (1.78); mistakes are more difficult to get fixed when using e-procurement (1.37); and that the legal infrastructure is ready (1.96); while strongly disagreeing with the statement that e-procurement is cumbersome to use with a mean of 1.00 as shown in Table 4.8 below. The results show that the ministries are ready to some extent in various areas of concern to the full adoption of e-procurement.

Table 4.8: Readiness to E-Procurement System

E-readiness	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Std Dev
Staffs within the ministry are sufficiently ICT literate to support the introduction of e-procurement	-	-	44.44%	55.56%	1.44	0.51
It is expensive to adopt e-procurement	22.22%	25.93%	37.04%	14.81%	2.56	1.01
There is lack of knowledge about e-procurement adoption	51.85%	25.93%	18.52%	3.70%	3.26	0.90
Benefits of e-procurement adoption are not good enough	-	-	81.48%	18.52%	1.81	0.40
It is complex to adopt e-procurement	-	11.11%	55.56%	33.33%	1.78	0.64
E-procurement is cumbersome to use	-	-	-	100%	1.00	0.00
Mistakes are more difficult to get fixed when using e-procurement	-	-	37.04%	62.96%	1.37	0.49
E-procurement creates the best way to purchase	74.07%	14.81%	7.41%	3.70%	3.59	0.80
There is concern over security of data	88.89%	11.11%	-	-	3.89	0.32
Data systems infrastructure-is ready	14.81%	48.15%	18.52%	18.52%	2.59	0.97
Management systems, records and work processes is in place	25.93%	33.33%	25.93%	14.81%	2.70	1.03
The legal infrastructure is ready	-	29.63%	37.04%	33.33%	1.96	0.81
Human infrastructure is ready	51.85%	33.33%	14.81%	-	3.37	0.74
Leadership and strategic thinking is ready	37.04%	37.04%	25.93%	-	3.11	0.80
Your organisation is ready for uptake of e-procurement	33.33%	22.22%	22.22%	22.22%	2.67	1.18
E-procurement provides opportunities for hackers to paralyze firm operations	62.96%	29.63%	7.41%	-	3.56	0.64

4.6 E-Procurement Strategies available in Kenya

Results from the study revealed that all the ministries have an e-procurement strategy in place, most of which are in the implementation stage. Further results (Figure 4.10) indicated that 25.93% of the respondents strongly agreed that the strategies that are in

place are adequate enough in the implementation of e- procurement within ministries, with a majority 55.56% of the respondents agreeing. However, 18.52% of the respondents disagreed. No respondents strongly disagreed. With a combined 81.49% of the respondents somehow agreeing, the results imply that most ministries have put in place strategies that will aid in the paradigm shift in procurement.

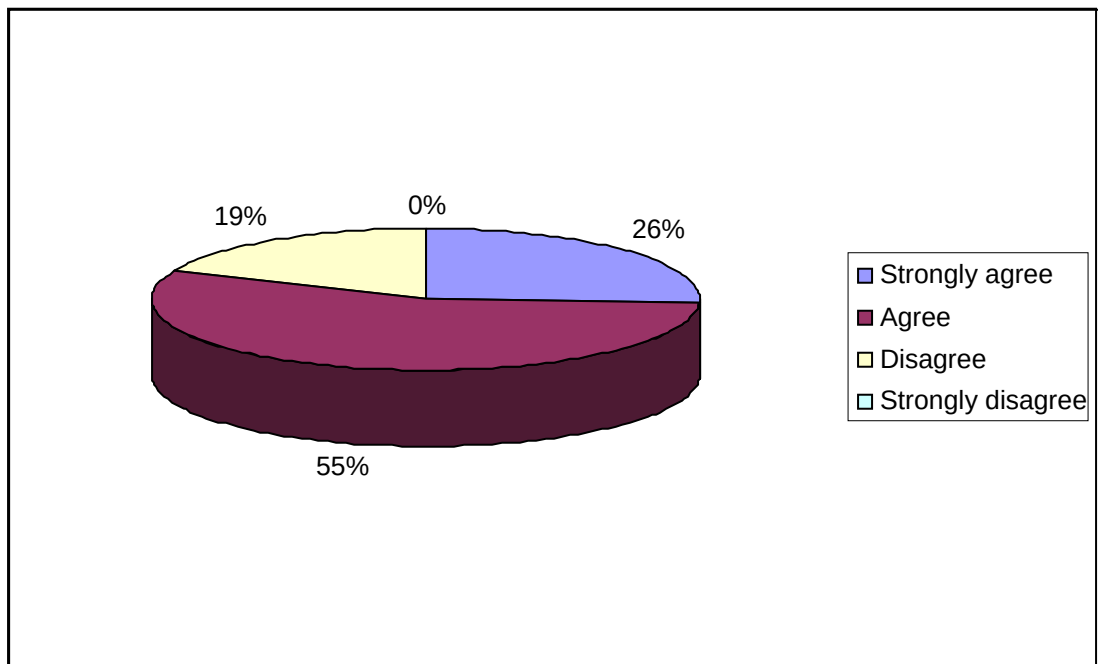


Figure 4.10: Adequacy of Available E-Procurement Strategies

4.6.1 Critical Success Factors in the adoption of E-procurement

The respondents were asked to indicate e-procurement adoption critical success factors. All the critical success factors considered in the study are very important in the adoption and implementation of e-procurement in the Kenyan public sector including: End-user uptake and training (3.52); supplier adoption (3.93); compliance with best practices for business case/ project management (4.00); security and authentication (4.00); re-engineering the process (3.70); top management support (3.44); performance measurement (3.41); change management (3.44); e-procurement implementation strategy (3.74); and technological standards (3.15) as shown in Table 4.9.

Table 4.9: Critical Success Factors in the adoption of E-procurement

Critical Success Factor	4	3	2	1	Mean	Std Dev
End-user uptake and training	59.26%	33.33%	7.41%	-	3.52	0.64
Supplier adoption	92.59%	7.41%	-	-	3.93	0.27
Compliance with best practices for business case/ project management	100%	-	-	-	4.00	0.00
Security and authentication	100%	-	-	-	4.00	0.00
Re-engineering the process	70.37%	29.63%	-	-	3.70	0.47
Top management support	55.56%	33.33%	11.11%	-	3.44	0.70
Performance measurement	40.74%	59.26%	-	-	3.41	0.50
Change management	44.44%	55.56%	-	-	3.44	0.51
E-procurement implementation strategy	74.07%	25.96%	-	-	3.74	0.45
Technological standards	37.04%	40.74%	22.22%	-	3.15	0.77

4.6.2 Procurement Structures in Ministries

The respondents were also asked to state their agreement level about procurement structures in the various ministries. The results (Table 4.10) revealed that the respondents strongly agreed that there is a functional procurement department with a mean of 3.59; the procurement department has clear roles and responsibilities (3.44); the procurement department has its own budget (3.44); procurement staffs can be trained on procurement related training qualifications (3.78); and that the ICT infrastructure can be availed easily to the procurement staffs (3.74); while agreeing that there is a qualified head of procurement (2.67); and that there is a benchmark for procurement efficiency and effectiveness (2.81). Respondents however disagreed that procurement staffs are encouraged to develop their own procurement-related skills and expertise (1.85).

Table 4.10: Procurement Structures in Ministries

Procurement structures	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Std Dev
There is a functional procurement department	66.67%	25.93%	7.41%	-	3.59	0.64
The procurement department has clear roles and responsibilities	48.15%	48.15%	3.70%	-	3.44	0.58
The procurement department has its own budget	51.85%	40.74%	7.41%	-	3.44	0.64
There is a qualified head of procurement	22.22%	33.33%	33.33%	11.11%	2.67	0.96
Procurement staffs are encouraged to develop their own procurement-related skills and expertise	-	18.52%	48.15%	33.33%	1.85	0.72
Procurement staffs can be trained on procurement related training qualifications	77.78%	22.22%	-	-	3.78	0.42
ICT infrastructure can be availed easily to the procurement staffs	74.07%	25.93%	-	-	3.74	0.45
You benchmark your procurement efficiency and effectiveness	18.52%	55.56%	14.81%	11.11%	2.81	0.88

4.7 Correlation Analysis

Correlation is a technique used to measure the strength of relationship between two variables. Correlation provides a measure of how well a least square regression line ‘fits’ the given data set. The better the correlation, the closer data points are to the regression line and hence the more confidence one would have in using the regression line for estimation. The study carried out a correlation analysis to determine the product moment of correlations between sets of the study variables, and to establish if there were any variables that were inter-related (multi-collinearity). These results are tabulated in Table 4.11.

Table 4.11: Correlation of Study Variables

		Drivers	Readiness	Strategies	Adoption
Drivers of Public Procurement	R	1			
	Sig. (2-tailed)				
	N	42			
E-Procurement Readiness	R	.518(*)	1		
	Sig. (2-tailed)	.00			
	N	42	42		
E-Procurement Strategies	R	.624(**)	.562(**)	1	
	Sig. (2-tailed)	.01	.00		
	N	42	42	42	
E-procurement Adoption strategy in Kenya	R	.616(**)	.552(**)	.715(**)	1
	Sig. (2-tailed)	.00	.02	.00	
	N	42	42	42	42

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

The correlation results in Table 4.11 indicate that there were significantly strong positive correlations between drivers of public procurement and the adoption strategy of e-procurement in Kenya ($r=0.616$ and $p< 0.01$); e-procurement readiness and the adoption of e-procurement in Kenya ($r=0.552$, $p< 0.01$); and e-procurement strategies and the adoption of e-procurement in Kenya ($r= 0.715$, $p< 0.01$). Since all the correlation results are positive, it means that a movement in any of them by one unit results in a movement in all the other variables individually in the same direction by a magnitude equal to the r-value.

4.8 Multiple Regression Analysis

Regression analysis shows the nature and the degree of the relationship that exists between sets of variables.

On one side of a regression model is the dependent variable while the independent variables appear on the right hand side of the model to showcase the relationships prevalent in such a model. In effect, the study carried out a multivariate regression analysis using the following model:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

Y = Adoption of E-procurement in Kenya

α = Constant Term

β = Beta coefficients

X_1 = Drivers of E-procurement

X_2 = E-procurement readiness

X_3 = E-procurement strategies

ϵ = Error Term

As shown on the Table 4.12, the model for the study is

$$Y = 4.89 + 0.169 X_1 + 0.1106 X_2 + 0.1433 X_3, \text{ as given by the coefficients.}$$

If one study independent variable was to be used to predict the adoption of e-procurement in the government ministries basing the choice on the standard error, that variable would have to be e-procurement readiness as it has the least value for error. Other than the intercept that had a value that was less than 1.50, all the other variables were individually statistically significant based on the t-stat. Finally, as indicated by the p-value, all the three explanatory variables were statistically significant at 95% confidence interval since their p-values were all less than 0.05. However, the intercept was not statistically significant as the p-value was more than 0.05 at 95% confidence level. These results are as shown in Table 4.12.

Table 4.12: Coefficients

	Coefficients	Standard Error	t Stat	P-value
Intercept	4.8900	4.34050	1.1266	0.6639
X ₁	0.1690	0.07189	2.1420	0.0204
X ₂	0.1106	0.03096	3.5724	0.0057
X ₃	0.1433	0.05974	2.3987	0.0001

There was a relationship between the predictor/independent variables combined (drivers of e-procurement; e-procurement readiness; and e-procurement strategies), and the dependent variable (adoption strategy of e-procurement in Kenya) with an intensity of 0.80644 as indicated by Multiple R (Table 4.13). The results further indicate that over 63% of the variances in the adoption of- e-procurement can be explained by the explanatory variables as indicated by both the R square and the adjusted R square. The error term, which is the difference between R square and the adjusted R Square, is equal to 0.01514196.

Table 4.13: Summary Output

Regression Statistics	
Multiple R	0.80644076
R Square	0.65034670
Adjusted R Square	0.63520474
Standard Error	180.017749
Observations	26

As shown by the F-statistic on Table 4.14, the model the study developed is reliable enough to explain the study observations. The significance value of 0.0221 which is less than 0.05 thus the model is statistically significant. Also the F-ratio of 54.2875 is thus statistically significant and indicates a good fit for the model.

Table 4.14: ANOVA

	Df	SS	MS	F	Significance F
Regression	3	12296.12	4098.71	54.2875	0.0221
Residual	22	1661.09	75.50		
Total	25	13957.21			

CHAPTER FIVE

DISCUSSION ON FINDINGS

5.1 Introduction

This chapter analyses the findings in the study in light of established theories and the empirical findings in other related studies. It presents the discussion in line with the objectives of the study.

5.2 The Drivers of Public Procurement

Drivers of public procurement range from process costs savings, service, product or material costs savings, transaction administration costs savings, reduced administrative costs, increased profit margins, strategic cost savings, enhanced inventory management, decrease in costs through reduced staff levels, shortened overall procurement cycle times, shortened communication cycle times, reduction in time through greater transparency, reduction in evaluation time, reduction in time through improved internal workflow, reduction in contract completion time, increased visibility in the supply chain, increased quality through benchmarking and market intelligence (Shakir, Smith & Gulec, 2007).

The findings of the study established that the main driver of e-procurement at the government ministries was enhanced inventory management. This was distantly followed by shortened overall procurement cycle time and increased quality through benchmarking. The other drivers which received little recognition included increased quality through increased competition, process cost savings and transaction administration costs savings. The findings support the contention by Smeltzer (2002) and Zahay and Handfield (2004) who held that antagonism exists in preceding research where supplier involvement was found to have no effect on uptake of procurement. Nonetheless, the findings established that the continuous drive towards organisational efficiency and lowering the cost to conduct business was the major notion driving the adoption of E-procurement (Lancioni, Smith & Schau, 2003).

The argument by Walker and Harland (2008) that there are five factors that appear to persuade the adoption of e-procurement – organizational, readiness, supply, strategic and policy factors was proved true to the extent of organizational, readiness, strategic and

policy factors. However, the aspect of supplier persuasion did not feature in the findings of this study.

The contention by Rajkumar (2001) that the internet and electronic commerce especially have much to offer in the way of increasing the efficiencies and competitive advantage of procurement was not upheld in the findings of the study with the internet not being prominently used in the procurement procedures at the selected ministries. However, the empirical findings by Dooley and Purchase (2006) which showed that suppliers' participation, internal managerial support and the perceived benefits gained through implementation all influence e-procurement intentions was upheld by the findings of this study.

The empirical findings by Joo and Kim (2004) that sufficient financial and resource backing and reliable and secure connectivity would increase a company's intentions to use E-procurement was also upheld in this case since the main hindrance to implementation of e-procurement at the selected ministries seemed to emanate from insufficient financing and resource backing, unreliability and insecure connectivity.

5.3 E-Procurement Readiness in the Public Sector

The findings of the study were that e-procurement was not prohibitively expensive, the level of knowledge about adoption of e-procurement was identified as sufficient to facilitate adoption of e-procurement at the selected ministries, the benefits of e-procurement were seen to be good enough at the selected ministries, adoption of e-procurement was generally viewed as a complex in its implementation and that it was not difficult to fix mistakes when using e-procurement. However the legal infrastructure was found not to be ready for e-procurement and even the leadership and strategic thinking was also found not ready for e-procurement. The findings can be equated to Parasuraman and Colby (2001) who established that technology have both positive and negative facets, and can be categorized into four distinct technology readiness dimensions, namely, optimism, innovativeness, discomfort, and insecurity.

The specific findings related to readiness for e-procurement at the selected ministries included lack of the right level of ICT literacy to support adoption of e-procurement and

inadequate business functionality and standards capacity which was found to be necessary for a full shift to e-procurement. The view that institutional capacity was crucial in readiness for a full shift to e-procurement was also established while governance capacity was identified as an important aspect in ensuring readiness for a full shift to e-procurement. Lastly, the application of technology capacity was identified as the most important aspect in ensuring a full shift to e-procurement. The findings are consistent with Parasuraman (2000) who described technology readiness as the people's propensity to embrace and use new technology for accomplishing goals in home life and at work.

The finding that the legal infrastructure was not ready for e-procurement at the selected ministries was in unison with the established laws in Kenya including the Kenya Communications Act of 1998; the Science and Technology Act, Chapter 250 of 1977; and the Kenya Broadcasting Corporation Act of 1988 and The national ICT policy (The Kenya Gazette, 2006) which recognizes that these Acts are inadequate in dealing with issues of convergence, electronic commerce and e- Government. Indeed, the inclusion of e-transactions in the Kenya Communications (Amendment) Act, 2009, would be a great step in the right direction in ensuring that the legal environment is ready for the full adoption of e-procurement in the Kenyan public sector.

5.4 E-Procurement Strategies Available in the Kenyan Public Sector

The findings of the study indicated that most ministries did not have strategies on e-procurement while the use of step by step implementation strategy was not common in implementing e-procurement at the sampled ministries. It was also established that the use of total replacement model strategy in implementation of e-procurement was not common in implementing e-procurement at the sampled ministries. In addition, the use of parallel model strategy in implementation of e-procurement was not common in implementing e-procurement at the sampled ministries. This is still evident despite the fact that in March 2004, the Government of Kenya launched an ambitious three year (2003-2007) E-government Strategy in line with the national development strategy for Wealth and Employment Creation that was to address the lack of a specific strategy in e-procurement adoption. Nonetheless, organisations are now realizing the importance of

the e- procurement and the main adoption strategies of total replacement model and conservative adaptation model would most likely be adopted. On the same vein, it may be impossible to adopt the total replacement model since it will not be possible to discard the traditional models since the cost to continuously involve in experimental advanced implementations would be prohibitive.

5.5 E-Procurement Adoption Strategy in the Kenyan Public Sector

A study by Yen and Ng (2002) reported that there is some resistance to e-procurement from suppliers who may not achieve benefits from the cost of development and process change involved in adoption of buyers' systems. Similarly, Quayle (2005) reports that suppliers can be a barrier to implementation, if they are either unwilling to take part or are unclear of what is required of them. In line with these empirical contentions the findings of this study depicted that the use of end user uptake and training would be an important success factor in adoption of e-procurement in the Kenyan public sector. Other success factors were identified as use of supplier adoption, compliance with best practices, security and authentication, process re-engineering, top management support, performance measurement, change management, establishment of an implementation strategy and creation of appropriate technological standards in all the public sector departments.

Tornatzky and Fleischer (1990) also proposed the technological context which describes the existing technologies in use and new technologies available to the organization as the foundation of a successful adoption strategy of technological projects. The findings of this study supports this view and established that some of the organizational characteristics and resources such as the organizational readiness, top management championship, and other factors relevant to organizational context were key success factors in the implementation of e-procurement in the Kenyan public sector. However, the environmental context would need that various ministries evaluate their unique environmental characteristics to understand the organization under which they conduct their services.

CHAPTER SIX

CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

Advances in information technology have done more than almost anything else to drive the last decade's economic boom and the integration of markets around the planet. ICT offers great benefits when it is combined with other organisational assets, such as new strategies, new business processes, new organisational structures and better educated and trained workers. This chapter therefore seeks to make conclusions from the discussions carried out on each of the research objectives and presents the researcher's recommendations.

6.2 Conclusions

A successful e-procurement adoption strategy requires policies, legislation and a legal framework that is conducive. The study made various conclusions based on the findings and discussions on the research objectives

The study concluded that the main drivers of e-procurement at the Kenyan public sector include enhanced inventory management, shortened overall procurement cycle time, increased quality through benchmarking, increased quality through increased competition, process cost savings and transaction administration costs savings.

The factors that were found to prohibit the readiness for e-procurement at the Kenyan public sector included high costs of establishments, low level of knowledge about adoption of e-procurement, unclear benefits of e-procurement, complexity of e-procurement implementation and difficulty in fixing mistakes when using e-procurement. Other key hindrances include inadequate legal infrastructure and lack of leadership and strategic thinking that favoured adoption of e-procurement. Moreover, there was lack of the right level of ICT literacy to support implementation of e-procurement and inadequate business functionality and standards capacity necessary for a full shift to e-procurement.

Other capacities found wanting included institutional capacity, governance capacity and the application of technology capacity. Lastly, a poor legal infrastructure was also

identified as an impediment to the adoption of e-procurement in the Kenyan public sector.

Line ministries had various options at their disposal including the step by step implementation strategy, total replacement model strategy and parallel model strategy in implementation of e-procurement. The main strategy that was adopted by most of the ministries was the conservative adaptation mode being informed by the need to avoid the high costs of experimental implementations.

Apart from the need to deal with the resistance from suppliers due to vested interests in the inefficient and corruptible manual procurement systems, the need to push for supplier adoption, compliance with best practices, security and authentication, process re-engineering, top management support, performance measurement, change management, establishment of an implementation strategy and creation of appropriate technological standards in all the public sector departments could not be overemphasized. The need for an environmental context evaluation would be necessary to identify the unique environmental characteristics and ensure success of the e-procurement strategy being implemented.

There were significantly strong positive correlations between drivers of public procurement and the adoption of e-procurement in Kenya ($r=0.616$ and $p< 0.01$); e-procurement readiness and the adoption of e-procurement in Kenya ($r=0.552$, $p< 0.01$); and e-procurement strategies and the adoption of e-procurement in Kenya ($r= 0.715$, $p< 0.01$). Since all the correlation results are positive, it means that a movement in any of them by one unit results in a movement in all the other variables individually in the same direction by a magnitude equal to the r -value. Over 63% of the variances in the adoption of e-procurement can be explained by the explanatory variables in the study.

6.3 Recommendations

Reengineering of procurement process and procedures are necessary to make adoption of e-procurement successful. Use of proper technology and knowledge would overcome the risk factors. Proper planning is mandatory for infrastructure developments in government ICT sector to facilitate adoption of e-procurement in government ministries. Laws of the land should be changed to suit the requirement of e-procurement. Comprehensive approach is important for successful adoption of e-procurement. The leadership should create a clear vision and strategy to overcome the barriers and challenges which might complicate the process of e-procurement adoption. In this regard the researcher made various recommendations based on the conclusions on each of the research objectives:

6.3.1 The Drivers of Public Procurement

There is need for a holistic approach to the implementation of e-procurement in the government ministries. This would require that all the envisioned benefits of e-procurement are sold in order to facilitate adoption of e-procurement at the Kenyan public sector. Therefore, there is need to align enhanced inventory management, shortened overall procurement cycle time, increased quality through benchmarking, increased quality through increased competition, process cost savings and transaction administration costs savings to the vision, values and strategic objectives of each government department in order to ensure that e-procurement is used as a tactical tool to attain the mission of the government ministries. This would lead to product or material costs savings, reduced administrative costs, increased profit margins, strategic cost savings, decrease in costs through reduced staff levels, shortened communication cycle times, reduction in time through greater transparency, reduction in evaluation time, reduction in time through improved internal workflow, reduction in contract completion time and increased visibility in the supply chain. Lastly, there is need for continuous benchmarking and market intelligence in order to ensure highest possible standards in the adopted e-procurement practices.

6.3.2 E-Procurement Readiness in the Public Sector

There is urgent need to roll out training on e-procurement to all officers in the government ministries in order to create a sense of shared vision among all the

stakeholders of the e-procurement venture. There is also need to ensure that the legal framework, leadership capacity, strategic objectives, organizational values and budgetary allocations are aligned to support the implementation of e-procurement practices.

6.3.3 E-Procurement Strategies Available in the Kenyan Public Sector

The most effective adoption strategy of e-procurement would be piecemeal (passive strategy) introduction of e-procurement procedures with an ultimate goal of overhauling the current manual systems. This should be guided by a strategic plan that would ensure that all the internal and external stakeholders of the ministries are adequately involved to reduce the instances of resistance.

6.3.4 E-Procurement Adoption Strategy in the Kenyan Public Sector

There are diverse strategies that organisations espouse towards-procurement technologies; the “wait and see” approach (strategy); the passive strategy and the aggressive strategy. There is need to push for process re-engineering, top management support, performance measurement, change management, establishment of an implementation strategy and creation of appropriate technological standards in all the public sector departments. However, all these efforts should be aligned with the most current developments in the field of e-procurement. This will only be possible if the affected government departments are open to the variables of the external environment like technological advancements, competitive moves and industrial best practices.

With only 41% of the respondents having attained university degrees, the government should put in place mechanisms that encourage more of its employees to uptake degree courses to boost the awareness and knowledge on policy implementation. It is further recommended that the ministries should train all their employees in the purchasing and procurement departments ICT skills to make it easier to fully implement e-procurement. To fully be acceptable, strategies used in the adoption and implementation of e-procurement should be developed with the participation of the implementers (procurement officers). Further, mechanisms to boost the full implementation of e-procurement should be put in place, with government and other stakeholders’ support being sought every so often.

Due to the extent of the use of funds transfers, ministries are encouraged to fully implement wire transfers which increase the transparency as well as tracking of transactions, which can be further boosted by wider application and use of global position services (GPSs). In a bid to increase efficiency and effectiveness of the procurement department within the ministries, adoption of online procurement methods should be used to a wider scale.

Interactively, e-procurement should also involve consumers/suppliers to further improve visibility of customer demand, which is currently seen as unimportant in most ministries. With most of the barriers limiting the full adoption and implementation of e-procurement requiring time to fully eliminate, the government should offer its employees training to avoid the high costs of hiring expertise, develop flexible, enduring and favourable frameworks for the adoption and implementation of e-procurement, and enhance data exchange programs within ministries. Faster progress should also be made to experience full benefits of e-procurement on the online procedures like online vendor selection, electronic posting and receipt of bids and the like.

Ministries should be more involved in using the existing capacity for better and faster implementation of e-procurement. Finally, the ministries should prioritise capacity improvement areas depending on current e-procurement needs.

6.4 Suggested Areas of Further Study

This study recommends areas of further research to include study on other government agencies on their levels of e-procurement adoption, a comparative study on the public sector and private sector on the adoption of e-procurement. This study also recommends further study on how corruption can be reduced by the adoption of e-procurement. The three independent variables explain only 63% of the factors that affect e-procurement adoption strategies as represented by the R^2 . This therefore means that other factors not studied in this study contribute 37%. Therefore, further research should be conducted to investigate this other factors. The aspect of supplier persuasion did not feature in the findings of this study contrary to previous established research and therefore this study recommend further study to confirm it.

Equally, there is need to undertake studies on how the existing legal infrastructure affects e-procurement strategies in the Kenya public sector. This study further recommends study on assessment of e-procurement policies in the Kenya public sector and their effectiveness in e-procurement adoption; analysis of e-procurement readiness in the Kenya public sector and how they affect e-procurement adoption strategies.

REFERENCES

- Aaker, D. A., Kumar, V. & Day, G.S. (2004). *Marketing research*. Boston: John Wiley & Sons.
- Aberdeen Group (1999). “*Strategic Procurement: The Next Wave of Procurement Automation*”. White Paper, July. 41 (3), 29-48
- Aberdeen Group (2004). “*Challenges to e-procurement success: The e-procurement benchmarking report*”
- Aberdeen Group (2001). “*Procurement service providers: full service procurement for competitive advantage*”.
- Aberdeen Group (2006). “*The e-procurement benchmark report: E-procurement 2.0*”.
- Aberdeen Group (2004). “*The e-procurement benchmarking report: less hype, more results*”.
- Aboelmaged, M.G. (2010), “Predicting e-procurement adoption in a developing country: an empirical integration of technology acceptance model and theory of planned behaviour”, *Industrial Management & Data Systems*, Vol. 110 No. 3, pp. 392-414.
- Adam, G., & Schvaneveldt, J. (1991). *Understanding Research Methods*. New York: Longman.
- AfDB 2008 *Rules* www.afdb.org/.
- Afonso, A., Schuknecht, L. and Tanzi, V. (2005), “Public sector efficiency: an international comparison”, *Public Choice*, Vol. 123 Nos 3/4, pp. 321-47.
- Afsharipur, A., Afshari A., Sahaf L., *E-procurement in automotive supply chain of Iran*, Master’s Thesis, Lulea University of Technology, Department of Business Administration and technology, Division of Industrial Marketing and e-commerce, 2006.

- Agriculture and Food Canada (2001). *The e-readiness of Canadian Agriculture and Food Canada SMEs*. Available at:
http://www.agr.gc.ca/misb/fb/food/ecommerce/eready/introduction_e.html (Accessed on 20 June 2012).
- Ajzen, I. (1985). “*From intentions to actions: A theory of planned behaviour*”. Berlin, Springer.
- Ajzen, I. (1991) The theory of planned behaviour, "*Organizational Behaviour and Human Decision Processes*", Vol. 50, pp 179-211.
- Al-Mashari, M., Irani, Z. and Zairi, M. (2001), “Holistic business process reengineering: an international empirical survey”, 34th *Hawaii International Conference on System Sciences, Hawaii*, pp. 10-19.
- Aman A., & Kasimin H., (2011), "E-procurement implementation: a case of Malaysia government", *Transforming Government: People, Process and Policy*, Vol. 5 Iss: 4 pp. 330 – 344.
- An exploratory analysis of the buying firms’ perspective. *IEEE Transactions on Engineering Management*, 49 (3), 293–304.32-33, 72.
- Angeles, R. and Nath, N., (2007) “Business-to-business e-procurement: success factors and challenges to implementation”. *Supply Chain Management: An International Journal*, 12 (2), 104–115.
- Angell. A. (2004) Available from <http://www.utexas.edu/research> (Accessed on 20 June, 2012)
- Arrowsmith, S (2005). *The Law of Public and Utilities Procurement*. Sweet & Maxell
- Arrowsmith, Sue, and Arwel Davies. (1998). *Public Procurement: Global Revolution*. London: Kluwer Law International.
- Aschhoff, B. and Sofka, W. (2008), “Innovation on demand – can public procurement drive market success of innovations?”, *Research Policy*, Vol. 38 No. 3, pp. 1235-47.

- Asogwa, B.E., Asiegbu F.N., (2009). “*Challenges and Opportunities for the Acquisition and Management of Government Publications in Electronic Age*, In Nigerian Library Link 7 (1 and 2), pp. 50-66.
- Attaran, M. (2003), “Information technology and business-process redesign”, *Business Process Management Journal*, Vol. 9 No. 4, pp. 440-58.
- Attaran, M. and Attaran, S. (2002) ‘Catch the wave of e-procurement’, *Industrial Management*, 11(3).
- B, Bartezzaghi E., and Ronchi. (2003). Internet Supporting The Procurement Process: Lessons From Four Case Studies. *Integrated Manufacturing Systems*, 14(8): 632 641
- Babbie, E. (1980) *The practice of Social Research*, Bolmont: Wadworth.
- Bahreman, B., (2010). “*Investigating Benefits and Limitations of applying e-procurement in B2B Automakers companies in Iran*”.
- Bartels, A., (2004) *Organizing the procurement function: what to centralize, what to decentralize*.
- Best, J.W. and Kahn, J.V. (1993) *Research in Education*, 7th ed. Boston: Allyn and Bacon.
- Boyer, K. K, and Olson, J.R. (2002) ‘Drivers of Internet Purchasing Success’, *Production and Operations Management*, 11(4):480-498
- Brack, K. (2000). E-procurement: the next frontier. *Industrial Distribution* 89: 65 – 70.
- Bridges.org. 2001. Comparison of E-readiness Assessment Models: Final Draft, 2(13). Available at: <http://www.bridges.org/eredainess/tools.tml> (Accessed on 20 June 2012).
- Brown, M. M. (2007). Understanding E-Government benefits. *American Review of Public Administration*, 37(2), 178-197.

- Brulhart, M. and Trionfetti, F. (2004), "Public expenditure, international specialisation and agglomeration", *European Economic Review*, Vol. 48 No. 4, pp. 851-81.
- Burton-Jones, A. and Hubona, G., (2006). The mediation of external variables in the technology acceptance model. *Information & Management*, 43 (6), 706–717.
- Carabello, L, (2001), "E-procurement can reduce expenses", *Healthcare financial management* 82-83.
- Carayannis, E.G. and Popescu, D. (2005), "Profiling a methodology for economic growth and convergence: learning from the EU e-procurement experience for central and eastern European countries", *Technovation*, Vol. 25, pp. 1-14.
- Carr, A. and Smeltzer, L., (2002) The relationship between information technology use and buyer–supplier relationships: An exploratory analysis of the buying firms' perspective. *IEEE Transactions on Engineering Management*, 49 (3), 293–304.
- Center for Advanced Procurement Studies. (2004). *Report of cross industry standard benchmarks*. (August). Friedman, J., T. Berquist, C. Debiase, S. Kahl, C.
- Chamberland, D. (2005), "Boosting your best practices", *Purchasing B2B*, Vol. 47 No. 6, pp. 16-17.
- Chan, K.K. and Spedding, T.A. (2003), "An integrated multidimensional process improvement methodology for manufacturing systems", *Computers & Industrial Engineering*, Vol. 44, pp. 673-93.
- Chen, Y., Rankin J., (2006). *A framework for benchmarking e-procurement in the AEC industry*, IECE' 06, Canada,
- Choucri, N., Maugis, V., Madnick, S., Siegel, M., Gillet, S., O'Donnel, S., Best, M., Zhu, H. and Haghseta, F. (2003), "Global e-Readiness – for what?", Case Paper 177.
- Ciol.com, Integration levels in EAI, 2002. Available on-line: <http://www.ciol.com/content/search/showarticle1.asp?artid=40712> (Accessed on 25 July 2012).

- Cloate, F. (2007). Knowledge management and trust in government: Lessons from South Africa. *Paper presented at Global Forum on Reinventing Government: Building Trust in Government, Vienna, Austria, 26-29 June 2007.*
- Coe, C. K. (1989). *Public Financial Management*. Englewood Cliff, NJ: Prentice Hall.
- Commonwealth Procurement Guidelines (2005), available at: www.dofa.gov.au/ctc/docs/commonwealth-procurement-guidelines (Accessed 22 April 2012).
- Commonwealth Telecommunications Organisation (2004), “Regional roundup: libraries help bridge the digital divide”, available at: www.ictdevagenda.org/frame.php?dir¼07&sd¼10&sid¼41&id¼441 (Accessed 20 June 2012).
- Cooper DRD.R. & Schindler, P.S. (2003) ‘*Business Research Methods*’. 8th ed. New York: McGraw-Hill.
- Corbett, C., Blackburn, J., and Wassenhove, L. *Case Study: Partnerships to improve Supply Chains. Sloan Management Review*, 1999, pp. 71-82
- Corini, J., (2000) Integrating e-procurement and strategic sourcing. *Supply Chain Management Review*, 4 (1), 70–75.
- Croom, S. & Brandon-Jones, A. (2004). “E-procurement: Key issues in e-procurement implementation and operation in the public sector”, 13th *International Purchasing & Supply Education & Research Association (IPSERA) Conference*, April 4-7, Catania, Italy.
- Croom, S. and Brandon-Jones, A. (2005). “Key issues in e-procurement: procurement implementation and operation in the public sector”, *Journal of Public Procurement*, Vol. 5, pp. 367-87.
- Croom, S. and Brandon-Jones, A., (2007). Impact of e-procurement: experiences from implementation in the UK public sector. *Journal of Purchasing & Supply Management*, 13 (4), 294–303.

- Croom, S. and Johnston, R. (2003). E-Service: Enhancing Internal Customer Service Through E-procurement. *Service Industry Management* 14(5): 539-555.
- Croom, S., 2001. Restructuring supply chains through information channel innovation. *International Journal of Operations*.
- Curry, Ian (2005). *Using Canadian Government Procurement to Improve Technology Diffusion, Adoption and Adaptation: Maximising Benefits and Managing Risks*. A Discussion Paper prepared for the Prime Minister's Advisory Council on Science and Technology (PMACST) June 12.
- Davila, A., Gupta, M., & Palmer, R. J. (2003). Moving Procurement Systems to the Internet: The Adoption and Use of E-procurement Technology Models. *European Management Journal*, 21(1), 11-23.
- Davis, F.D. (1989). "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-40.
- Davis, F.D., Bagozzi, R.P., and Warshaw, P.R., (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35 (8), 982–1003.
- Deeter, Schmelz, D., Bizzari, A., Graham, R., and Howdyshell, C. (2001) Business-to-Business online Purchasing: Supplier's Impact on Buyer's Adoption and Usage Intent. *The Journal of Supply Chain Management*. 37(1), 4-10.
- Dewar, R.D. & Dutton, J.E. (1986). The adoption of radical and incremental innovations: an empirical analysis. *Management Science* 32 (11): 1422 – 1433.
- Diamantopoulos, A. and Schlegelmilch, B.B. (2000) *Taking the fear out of data analysis*. Australia, Thomson Learning Business Press.
- Docktor, Roslyn. 2002. *Accelerating e-government...e-readiness at work*. Regional Workshop on Building E-governance Capacity in Africa. Available at: <http://unpan1.un.org/intradoc/groups/public/documents/CAFRAD/UNPAN006617.pdf>

- Dooley, K. and Purchase, S. (2004) *Factors Influencing Electronic Procurement Usage*. 13th Annual IPSERA Conference. University of Cantania.
- Du Plessis, P.J. & Rousseau, G.G. (2005). *Buyer behaviour: a multi cultural approach*. Second edition. Johannesburg: Thompson Publishing.
- Eakin, D. (2003) 'Measuring e-procurement benefits', *Summit: Canada's Magazine on Public Sector Purchasing*.
- Edler, J. and Georghiou, L. (2007), "Public procurement and innovation – resurrecting the demand side", *Research Policy*, Vol. 36 No. 7, pp. 949-63.
- Ellram, L. and Zsidisin, G., (2002) *Factors that drive purchasing and supply management's use of information technology*.
- Emory, C. W. & Cooper, D. R. (1991). *Business research methods* 4th ed. Sydney: Irwin.
- Evenett, S.J. and Hoekman, B.M. (2005), "Government procurement: market access, transparency, and multilateral trade rules", *European Journal of Political Economy*, Vol. 21, pp. 163-83.
- Fisher, A. (2000) 'It's a small world after all', *Financial Times*: 6–7.
- Galbraith, J.R. (1977). *Organizational design*. Reading (MA), Addison-Wesley
- Gupta, U.G. (1997). The new revolution: intranets, not internet. *Production & Inventory Management Journal* 38: 16 – 20.
- Hage, J. (1980). *Theories of organizations: Forms, process and transformation*, New York, John Wiley & Sons.
- Harink, J.H.A. (2003). *Internet-technologie en inkoop: De kinderschoenen ontgroeid*. PhD at Eindhoven University [in Dutch].
- Harland, C., Caldwell, N., Powell, P. & Zheng, J. 2007. 'Barriers to supply chain information integration: SMEs adrift of eLands', *Journal of Operations Management*, 25: 1234-1254

- Hawking P., Stein A., Wyld D. and Forster S. (2004). E-procurement: is the ugly duckling actually a swan down under?, *Asia Pacific Journal of Marketing and Logistics* Vol. 16 No. 1. 1-26.
- Hawkins, R., Robin M., and Edward, S., (1998). *Towards 'Digital Intermediation in the European Information Society*, Fair Working Paper No. 50, SPRU, March.
- Herzog, T. (1996), *Research Methods in the Social Sciences*, Prentice-Hall, Upper Saddle River.
- IBM Global Service, (2002). *Private Exchanges: Looking to the Pioneers for Value Earned and Lessons Learned*. White Paper.
- IEEE Transactions on Engineering Management*, 49 (3), 269–281.
- ISM/Forrester Research. (2003) *Technology in supply management*. ISM/Forrester Research
- IT View and Business View Best Practices*. Cambridge: Forrester Research.
- Jarboe, G.R. (1999). *The Marketing Research Project Manual*. Fourth edition. Ohio: South-Western College Publishing.
- Joo, Y.B and Kim, Y.G. (2004) 'Determinants of Corporate Adoption of e-Marketplace: An Innovation Theory Perspective', *Journal of Procurement and Supply Management* 10(2): 89-101.
- Kalakota & Robinson (2001), "*E-procurement: Is the Ugly Duckling Actually a Swan Down Under?*" School of Information Systems, Victoria University.
- Kalakota, R. and Robinson, M. (2001) *E-business 2.0: Roadmap for Success*. Boston, MA: Addison Wesley Longman.
- Kamal M..M., (2006),"IT innovation adoption in the government sector: identifying the critical success factors", *Journal of Enterprise Information Management*, Vol. 19 Iss: 2 pp. 192 – 222.
- Kaufman, P.,(1999). Food Retailing Consolidation: Implications for Supply Chain Management Practices,|| *Journal of Food Distribution Research*, 305-11.

- Kaufmann, L. (1999). 'Purchasing and supply management – a conceptual framework', In: Kaufmann, L. and Hahn, D. Eds. *Handbuch Industrielles Beschaffungsmanagement: Internationale Konzepte – Innovative Instrumente – Aktuelle Praxisbeispiele*, Gabler, Wiesbaden. 3-32.
- Kenya Vision 2030 (2003). Kenya Ministry of State Planning, National Development and Vision 2030.
- Khandwalla, P. (1970) *Environment and the organization structure of firms*, McGill University, Montreal, Faculty of Management.
- Khandwalla, P. (1970). *Environment and the organization structure of firms*, McGill University, Montreal, Faculty of Management.
- Kheng, C.B. and Al-Hawandeh, S. (2002) 'The adoption of electronic procurement in Singapore', *Electronic Commerce Research*, 2(1/2): 61-73.
- Kiele, P. J., (2001). Research: *What Clients Expect of e-Technology*. In SMPS Marketer. 2001. (cit. 2011- 10-20). Cited from <http://www.docstoc.com/docs/70354121/E-Technology>.
- Killen, K.H. and Kamauff, J.W. (1995) *Managing Purchasing: Making the Supply Team Work*. New York, NY: McGraw-Hill.
- King, W. and He, J., 2006) A meta-analysis of the technology acceptance model. *Information & Management*, 43 (6), 740–755.
- Kitaw Y (2006). *E-Government in Africa: prospects, challenges and practice*.
- Klischewski R, Scholl HJ (2006). Information Quality as a Common Ground for Key Players in e-Government Integration and Interoperability, in *Proceedings of the 39th Hawaii International Conference on System Sciences*.
- Knudsen, D. (2003), "Aligning corporate strategy, procurement strategy and e-procurement tools", *International Journal of Physical Distribution & Logistics Management*, Vol. 33 No. 8, pp. 720-34.

- Koontze LD (2003). *Electronic government: proposal, addresses, and critical challenges*. The UN General Accounting Office.
- Kumaraswamy, M.M., Palaneeswaran, E. and Humphreys, P. (2000). Selection matters – in construction supply chain optimisation. *International Journal of Physical Distribution and Logistics Management*, 30(7/8): 661–680.
- Lamb, C.W., Hair, J.F. & McDaniel, C. (2004). *Essentials of Marketing*. 5th ed. Mason, OH: South-Western.
- Lancioni, R., Smith, M. & Schau, H. (2003). Strategic Internet Application trends in supply chain management. *Industrial Marketing Management* 32: 211 – 217.
- Lancioni, R.A., Smith, M.F. & Oliva, T.A. (2000). ‘The role of the internet in Supply Chain Management’, *Industrial Marketing Management*, 29:45-56.
- Leedy, P.D. & Ormrod, J.E. (2001). *Practical Research, Planning and Design*. 7th Ed. Columbus, Ohio: Merrill Prentice Hall.
- Lennon, C. (2002). ‘Achieving Bottom Line Results in a Flat Economy: Leveraging Procurement Business Services,’ Computer Sciences Corporation, El Segundo, CA.
- Li, Yanchao (2011). *Public procurement as a demand - side innovation policy tool in China – a national level case study*. DRUID Society Conference 2011 on Innovation, Strategy, and Structure. Copenhagen Business School, Denmark, June 15 - June 17.
- Ma, Q. and Liu, L., 2004. The technology acceptance model: a meta-analysis of empirical findings. *Journal of Organizational and End-User Computing*, 16 (1), 59–72.
- MacIntosh, R. (2003), “BPR: alive and well in the public sector”, *International Journal of Operations & Production Management*, Vol. 23 No. 3, pp. 327-44.
- MacManus, S.A., Understanding the incremental nature of e-procurement implementation at the state and local levels. *Journal of Public Procurement*, 2(1): pp5-28, 2002 *Management Journal*, 42(1): 48

- Malo, R., (2010). E-activities Based Business Model: The Case for E-technology Implementation. In: *Proceedings of the IADIS International Conference on e-Commerce*. Freiburg: IADIS Press, p. 173–176.
- Mani, Sunil (2003). *Deregulation, Entry of MNCs, Public technology procurement and Innovation capability in India's Telecommunications Equipment Industry*. The United Nations University, INTECH, Institute for New Technologies. April.
- Maniam, K., Murali, R., Halimah, A. and Magiswary, D. (2006). “A case study on Malaysia's E-Perolehan (e-procurement) initiative”, *echnology in Government*, Jaijit Bhattacharya, GIFT Publishing, Delhi, pp. 232-41.
- Martins, J.H., Loubser, M. & Van Wyk, H.J. 1996. *Marketing research: a South African approach*. Pretoria: Unisa Press.
- Matechak, J. (2005), “*Fighting corruption in public procurement*”, Center for International Private Enterprise, available at: www.cipe.org/pdf/publications/fs/matechak.pdf (Accessed 26 May, 2012).
- McDaniel, C & Gates, R. (2001). *Marketing research essentials*. 3rd Ed. Cincinnati, Ohio: South-Western College.
- McDonough, William and Michael Braungart (2002). *Cradle to Cradle Remaking the Way We Make Things*. North Point Press.
- Melville, N., Kraemer, K. and Gurbaxani, V. (2004), “Information technology and organisational performance: an integrative model of IT business value”, *MIS Quarterly*, Vol. 28, pp. 283-322.
- Mick, D.G. and Fournier, S. (1998), “Paradoxes of technology: consumer cognisance, emotions and coping strategies”, *Journal of Consumer Research*, Vol. 25 No. 2, pp. 123-43.
- Min, H. & Galle, W. P. (1999). E-commerce usage in B2B purchasing. *International Journal of Operations & Production Management* 19: 909 – 921.

- Min, H. and Galle, W.P., 2003. E-purchasing: profiles of adopters and non-adopters. *Industrial Marketing Management*, 32 (3), 227–233.
- Minahan, T. and Degan, G., (2001)0. *Best practices in e-procurement*, Boston: Aberdeen Group.
- Ming-Ling Lai, (2008). "Technology readiness, internet self-efficacy and computing experience of professional accounting students", *Campus-Wide Information Systems*, Vol. 25 Iss: 1 pp. 18 – 29.
- Mitchell, K. (2000). "Instituting E-procurement in the Public Sector." *Government Finance Review*, 16(1), 9-12.
- Mnjama N, Wamukoya J, Mutula S (2008). *E-Government and E-Records Management, In Information and Knowledge Management in the Digital A*, Aina LO, Mutula SM, Tihamiyu MA (eds), Ibadan: Third World Information Services.
- Monczka et. al (2005), "*Supply management strategies for the future: a Delphi study*", Journal of Supply Chain Management Ogden, J.A., Petersen, K.J., Carter, J.R. and Monczka, R.M.
- Moon, M. J., & Norris, D. F. (2005). Does managerial orientation matter? The adoption of reinventing government and E-Government at the municipal level. *Information Systems Journal*, 15(1), 43–60.
- Motiwalla, L.; Khan, M.R. & Xu, S. (2005). 'An intra- and inter-industry analysis of e-business effectiveness', *Information and Management* 42(5): 651-667.
- Muffato, M., Payaro A., Implementation of e-procurement and e-fulfilment processes: a comparison of cases in motorcycle industry, *International Journal of Production Economics*, 89, 339-351, 2004.
- Mugenda, O.M., & Mugenda, A., G. (2003). *Research methods quantitative and qualitative approaches*: Nairobi. Applied Research and Training Services Press.

- Myoken, Yumiko (2010). Demand - orientated policy on leading - edge industry and technology: public procurement for innovation. *Int. J. Technology Management*, Vol. 49, Nos. 1/2/3, pp. 196 - 219.
- Nachmias, D., & Nachmias, C. (2004). *Research Method in the social sciences*: Boston, St.Martins Press CA, USA
- National Institute of Governmental Purchasing (1996). *NIGP Dictionary of Purchasing Terms* (5th ed.). Herndon, VA: Author. NJ.
- Nwabuzor, A. (2005), “Corruption and development: new initiatives in economic openness and strengthened rule of law”, *Journal of Business Ethics*, Vol. 59 No. 1, pp. 121-38.
- OECD (2009). *OECD in Figures*, OECD, Paris.
- Office for Government Commerce (2005). *E-procurement in Action: A Guide to e-procurement for the Public Sector* (London: Office for Government Commerce).
- Ogden, J.A., Petersen, K.J., Carter, J.R., Monczka, R.M., 2005. Supply management Strategies for the Future: A Delphi Study” *Journal of Supply Chain Management* .
- Ojo, A., Janowski, T. and Estevez, E. (2007). “*Determining progress towards e-Government – what are the core indicators?*”, Report No. 360, United Nations University, International Institute of Software Technology, Macao.
- Okello W. (2009) *E-Procurement Model for the Public Sector of Kenya*, School of Computing & Informatics Building Chiromo Campus, University of Nairobi.
- Oliveira, T and Martins, M, F. (2011). “Literature Review of Information Technology Adoption Models at Firm Level” *The Electronic Journal Information Systems Evaluation* Volume 14 Issue 1 (pp110- 121), available online at www.ejise.com (Accessed 25 July 2012).
- Organizational form and function. In: *The Journal of High Technology Management Research*, Volume 18, Issue 1, p. 15–30.

- Osmonbekov, T.; Bello, D.C. & Gilliland, D.I. (2002). 'Adoption of electronic commerce tools in business procurement: enhanced buying center structure and process', *Journal of Business and Industrial Marketing* 17(2/3):151-166.
- Odhiambo, W and Kamau P., (2003). "Public Procurement: Lessons from Kenya, Tanzania and Uganda". Working paper No 208, OECD Development Center.
- Panayiotou N.A. Sotiris G.P. and Tatsiopoulos I.P. (2003). An e-procurement system for governmental purchasing, *International Journal of Production Economics*, Vol. 90 (2004) 79-102.
- Panayiotou, N., Gayialis, S. & Tatsiopoulos, I. (2004). 'An e-procurement system for governmental purchasing', *International Journal of Production Economics*, 90: 79-102.
- Parasuraman, A. (2000). "Technology readiness index (TRI): a multiple-item scale to measure. *Journal of Service Research* May 2000 2: 307-320
- Parasuraman, A. and Colby, C.L. (2001), *Techno-ready Marketing: How and Why Your Customers Adopt Technology*, The Free Press, New York, NY.
- Pressutti, W.D., (2003). Supply Management And E-procurement: Creating Value Added In The Supply Chain. *Industrial Marketing Management* 33(3): 219-226 25.
- Procurement and Supply in Kenya (2008). *The market for small and medium enterprise* July pg. 6
- Przymus, N. K., (2003). *What Minneapolis, Minnesota Can Learn from Other Governments*, Metropolitan State University.
- Pushmann, T. and Alt, R., 2005. Successful use of e-procurement in supply chains. *Supply Chain Management: An International Journal*, 10 (2), 122–133.
- Quayle M., 2005, The Real Management Implications of E-procurement: the Importance of Involving People, *Journal of General Management*, vol. 31, no.1.

- Rajkumar, T.M. 2001. 'E-procurement business and technical issues', *Information Systems Management*, 18(4):52-61.
- Ramamurthy, K., Premkumar, G., and Crum, M.R. Organisational and Interorganisational Determinants of EDI Diffusion and Organisational Performance, A Causal Model. *Journal of Organisation Computing and Electronic Commerce*, 9(4), pp 253-285
- Rehan, M., (2006). *E-Procurement: Supply Chain Management*, Seçkin Yayıncılık, Ankara, Turkey
- Reinermann, Heinrich, and Jörn von Lucke (2002). "Speyerer Definition von Electronic Governance." *Electronic Government in Deutschland*. Eds. Heinrich Reinermann and Jörn von Lucke. Speyer: Forschungsint. für Öffentliche Verwaltung, pp. 9-19.
- Reitz, J.C., (2006) Computers and Law: E-Government The American Society of Comparative Law, Inc. *The American Journal of Comparative Law* Fall 2006
- Reunis, M.R.B., Raaij, E.M., and Santema, S.C., (2004). Actor-to-actor dissemination of electronic procurement (EP) adoption: an exploration of influencing factors. *Journal of Purchasing & Supply Management*, 10 (4–5), 201–210.
- Robb, D. (2001, April). "Building a Successful E-Govt Strategy." *Government Technology*, 48, 50.
- Rogers, E.M. (1995). *Diffusion of innovations*, Fourth Edition ed., New York, Free Press.
- Sain, B., Owens, J. D., & Hill, J. D. (2004). Advances in e-procurement: A focus on the product/buying situation. *Management Services*, 48(6), 10-14.
- Sanders, N. (2005), "IT alignment in supply chain relationships: a study of supplier benefits", *Journal of Supply Chain Management*, Vol. 41, pp. 4-13.
- Sarantakos, S. (2005). *Social Research*. Hampshire: Palgrave Macmillan.
- Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research Methods for Business Students*. Harlow, England: Prentice Hall

- Schmidt W., (1997). World-wide web survey research: benefits, potential problems, and solutions, *Behaviour Research Methods, Instruments and Computers*, Vol..29, No.2. 274-279.
- Schmidt, M. J., & Hollensen, S.(2006). *Marketing Research: An International Approach*. U.K: Prentice Hall.
- Schoenherr, T. and Tummala, V.M.R. (2007). “Electronic procurement: a structured literature review and directions for future research”, *International Journal of Procurement Management*, Vol. 1, pp. 8-37.
- Scholl, H.J. and Klischewski, R. (2007).“E-government integration and interoperability: framing the research agenda”, *International Journal of Public Administration*, Vol. 30, pp. 1-32.
- Settoon, R.P. and Wyld D.C., (2003). The Ski Slope To Prosperity: An Analysis Of The Potential Impact Of Reverse Auctions In Government Procurement In Five Southeast Asian Nations. *Asia Pacific Journal Of Marketing And Logistics* **26**(5).
- Shakir, M., Smith, G.R. & Gulec, E. (2007). ‘Business-to business e-procurement’, *MIS Quarterly Executive*, 6(4): 225.
- Sheng, M.L. (2002). ‘*The impact of Internet-based technologies on the procurement strategy*’, in proceedings of the 2nd International Conference on Electronic Commerce, Taipei, December.
- Sigala, M. (2003). Investigating the e-factors impacting e-commerce adoption by SMTHes in Greece. *2nd International Scientific Conference*. 2nd -5th 10, Chios, Greece.
- Siguaw, J.A.,ENZ, C.A., & Namasivayam, K. (2000). *Adoption of Information Technology*.
- Silverman, D. (2000). *Doing qualitative research: A practical handbook*. London: Sage.

- Smith-Deighton, R. (2004). "Regulatory transparency in OECD countries: overview, trends and challenges", *Australian Journal of Public Administration*, Vol. 63 No. 1, pp. 66-73.
- Stephen M. Mutula, Pieter van Brakel, (2006)."E-readiness of SMEs in the ICT sector in Botswana with respect to information access", *The Electronic Library*, Vol. 24 Iss: 3 pp. 402 – 417.
- Stiglitz, J.E., Orszag, P.R., & Orszag, J.M. (2000). *The role of government in a digital age*. (Commissioned by the Computer Communications Industry Association).
- Subramani, M. (2004), "How do suppliers benefit from information technology use in supply chain relationships?", *MIS Quarterly*, Vol. 28, pp. 45-73.
- Subramaniam, C. and Shaw, M.J. (2002). 'A study of the value and impact of B2B e commerce: the case of web-based procurement', *International Journal of Electronic Commerce*, 6(4):19-40.
- Sudan R (2005). *The Basic Building Block of E-government*. In Robert Schware (Ed) *E-development: From excitement to effectiveness*. Washington DC: the World Bank group.
- Swaminathan, J. M., Tayur, S. R., (2003) "Models for Supply Chains in E-Business", *Management Science*, 49(10): 1387-1406.
- Tanner, C, et al. (2008) Current trends and challenges in electronic procurement: an empirical study. *Electronic markets*, V. 18 n. 1:6-18.
- Tatsis, V., Mena, C., Van Wassenhove, L.N. and Whicker, L. (2006), "E-procurement in the Greek food and drink industry: drivers and impediments", *Journal of Purchasing & Supply Management*, Vol. 12, pp. 63-74.
- Telgen, J. et al. (2007). *Reader: Purchasing Management*" Lecture supplements, course code 182016, University of Twente 2007/2008.

- Terziovski, M.E., Fitzpatrick, P. and O'Neill, P. (2003). "Successful predictors of business process reengineering (BPR) in financial services", *International Journal of Production Economics*, Vol. 84, pp. 35-50.
- Thai, K.V. (2001). "Public procurement re-examined", *Journal of Public Procurement*, Vol. 1 No. 1, pp. 9-50.
- The US – China Business Council (2010). Issue brief: *New Developments in China's Domestic Innovation Policies*. (Accessed 6 June 2012) https://www.uschina.org/public/.../domestic_innovation_policies.pdf accessed on 20 June 2012
- Thompson, J.D. (1967). *Organizations in action*, New York, McGraw-Hill.
- Tieman, R. (2003). "A revolution in public procurement: UK's private finance initiative." *Finance Times*, London, November 24, pp. 4. & *Production Management*, 21 (4), 504–515.
- Tonkin (2003). *E-procurement in the Public Sector: Story Myth and Legend*, a working paper presented to the policy institute at Trinity College Dublin on 18th November 2003.
- Tornatzky, L. and Fleischer, M. (1990) *The process of technology innovation*, Lexington, MA, Lexington.
- Towns, S. (2001). "Security Blanket: Public Key Infrastructure Unlocks E-Government Potential." *Government Technology*, 26-28.
- Transparency International (2006). *Handbook: Curbing Corruption in Public Procurement*, Transparency International, Berlin
- Trionfetti, F. (2000). "Discriminatory public procurement and international trade", *World Economy*, Vol. 23 No. 1, pp. 57-76.
- Tustin, D.H., Ligthelm, A. A., Martins, J. H. & Van Wyk, H. de J. (2005). *Marketing research in practice*. Pretoria: Unisa Press.

- U.S. hotels: strategically driven objectives. *Journal of Travel Research* 39: 192-201.
- Uganda Country Procurement Assessment (CPAR) Team (2004). *Uganda Country Procurement Assessment Report*.
- Uyarra, E. and Flanagan, K. (2010). "Understanding the innovation impacts of public procurement", *European Planning Studies*, Vol. 18 No. 1, pp. 123-43.
- Van Raaij, E., Brandon-Jones, A., and Reunis, M., 2007. The impact of e-procurement quality factors on user acceptance of e-procurement systems. In: R. Laming ed., *Practice makes perfect, Conference proceedings of the 16th annual IPSERA conference*, Bath, UK: University of Bath.
- Van Weele, A.J. (2005). *Purchasing and supply chain management—Analysis, strategy, planning and practice* (4th ed.). London: Thomson Learning.
- Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003) User acceptance of information technology: Toward a unified view, *"MIS Quarterly"*, Vol. 27, No. 3, pp. 425-478.
- Wade, M. (2009) *Resource-based view of the firm* [online]. http://www.fsc.yorku.ca/york/istheory/wiki/index.php/Resource-based_view_of_the_firm (Accessed 10 June 2012)
- Wahid, F. (2010), *"Examining adoption of e-procurement in public sector using the perceived characteristics of innovating: Indonesian perspective"*, in Sideridis, A.B. and Patrikakis, Ch. Z. (Eds), *E-Democracy*, LNICST 26, Springer, Berlin, pp. 64-75.
- Walker ,H., and Harland, C .2008. 'E-procurement in the United Nations: influences, issues and impact ' *International Journal of Operations & Production Management*, 28(9): 831-857.
- Welman, J.C. & Kruger, S.J. 2002. *Research methodology* 2nd ed. Oxford: Oxford University Press.

- West, D. M. (2004). E-Government and the transformation of service delivery and citizen attitudes. *Public Administration Review*, 64(1), 15–27.
- White, A., Daniel, L., and Wilkinson, M., 2004. The impact of e-marketplaces on buyer–supplier relationships: a cross industry perspective of the “move to the middle” hypothesis. *International Journal of Information Technology and Management*, 3 (2), 127–140.
- Williams, S. and Hardy, C. 2007. *E-procurement: Current Issues and Future Challenges: proceedings of the European Conference on Information Systems (ECIS 2006)*, 12–14 June, Gothenburg, Sweden, 131–142.
- Williams, S.P., et al., 2006. *Report on the findings of the 2006 Australian national e-procurement survey*. National e-procurement Research Project Australia. Available from: <http://hdl.handle.net/2123/1227> (Accessed 11 July 2012).
- Wilmshurst, T.D. and Frost, G.R. (2000), “Corporate environmental reporting – a test of legitimacy theory”, *Accounting, Auditing & Accountability Journal*, Vol. 13 No. 1, pp.10-26.
- Wimmer R.D.and Dominick, J.R. (1994). *Mass Media Research*. Belmont, California: Wadsworth.
- Wu, F., Zsidisin, G.A. and Ross, A.D. (2007). “Antecedents and outcomes of e-procurement adoption: an integrative model”, *IEEE Transactions on Engineering Management*, Vol. 54, pp. 576-87.
- Yen, B.P.-C. and Ng, E.O.S. (2003), “The impact of electronic commerce on procurement”, *Journal of Organizational Computing and Electronic Commerce*, Vol. 13 Nos 3-4, pp. 167-89.
- Yen, B.P.C. and Ng, E.O.S. 2002. ‘Migrating procurement onto the internet’, *Electronic Commerce Research*, 2:113-34.
- Yin, R. K. (2003). *Case Study Research: Design and Methods*, (Second Edition Ed.).

- Yin, R.K. (2003) *Case Study Research: Design and Methods*. Stage Publication, Inc (Third Edition).
- Zahay, D. and Handfield, R. 2004. *The role of learning and technical capabilities in predicting adoption of B2B technologies*. *Industrial Marketing Management*. 33, 627-641. ANZMAC.
- Zenz, G. J. 1994. '*Purchasing and the Management of Materials*'. 7th ed. New York, NY: John Wiley & Sons.
- Zhu, K., K. L. Kraemer, S. Xu. (2003). E-business adoption by European firms: A cross-country assessment of the facilitators and inhibitors. *Eur. J. Inform. Systems* 12(4) 251–268.
- Zikmund, W.G. & d'AMICO, M. (2001). *Marketing: creating and keeping customers*. Seventh edition. Ohio: South-Western College Publishing.

APPENDICES

APPENDIX A: INTRODUCTION LETTER

Questionnaire number

Jan 2013

Dear Respondent,

RE: REQUEST FOR RESEARCH DATA

I am a Master of Commerce student at Strathmore University. I am required to submit as part of my assessment a research project. Consequently, I have written a thesis entitled **“E-Procurement Adoption Strategy in the Kenya Public Sector”**.

To achieve this I have the pleasure to have your participation in this study. I kindly request you to fill the attached questionnaire to generate data required for this study. The information given will be treated with outmost confidentiality and will be used purely for academic purpose. Findings of the study shall upon request be availed to you.

Your assistance and cooperation will be highly appreciated.

Thanking you in advance

Yours sincerely,

MOHAMED ABDULLAHI AHMED

Student researcher

APPENDIX B: QUESTIONNAIRES

Section A: Demographic Information

A1. Respondent name (optional).....

A2. Respondent mobile number (optional).....

A3. Respondent email address (optional).....

A4. Please indicate your age bracket. Please put a [$\sqrt{}$] in the brackets next to the right response

- | | |
|-----------------------------------|----------------------------------|
| ☐ Below 21 | ☐ 41-45 |
| ☐ 21-25 | ☐ 46-50 |
| ☐ 26-30 | ☐ 51-55 |
| ☐ 31-35 | ☐ 56-60 |
| ☐ 36-40 | ☐ Over 60 |

A5. Please indicate your educational level

High School ☐ Diploma ☐ Bachelors Degree ☐ Masters Degree ☐ PhD ☐
Other (please specify).....

A6. Please indicate the number of years served in the organization

< 1 year ☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ Over 15 years ☐

A7. Please indicate your job title in this ministry.....

A8. What is the number of years you spent in your current position?

< 1year ☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ Over 15 years ☐

A9. Number of years you have used ICT infrastructure for procurement purpose

< 1year ☐ 1-5 years ☐ 6-10 years ☐ 11-15 years ☐ Over 15 years ☐

Section B: E-Procurement

B1. Has your organisation adopted e-procurement system in its procurement activities?

☐ Yes ☐ No

B2. Does your ministry have e-procurement policy?

Yes ☐ No ☐

B3. Rate the e-procurement policy in your ministry

Strongly favourable (5)

Favourable (4)

Uncertain (3)

Unfavourable (2)

Strongly unfavourable (1)

B4. What is the level of adoption of e-procurement in your ministry?

Very High (4)

High (3)

Low (2)

Very Low (1)

B5. Please identify which type(s) of e-procurement currently used in your ministry

☐ E-sourcing

☐ E-tendering

☐ E-informing

☐ Others (please specify).....

B6. Please indicate which of the following restricts the adoption of e-procurement

☐ ICT infrastructure ☐ Current financial system ☐ Both

B7. Indicate the extent to which the incidence of E-Procurement System Adoption in your ministry on a scale of 1 to 4 where 1 is to a very little extent; 2 to a little extent; 3 to a large extent and 4 to a very large extent

System Incidence	Very large extent	Large extent	Little extent	Very little extent
E-mail				
Websites				
Funds transfer				
Electronic data interchange				
MS Outlook				
Lotus notes				
Knowledge sharing				
E-procurement				
Intranet				
Portals				
Global positioning systems				

B8. Please comment on where the decision to adopt e-procurement reached was

- ☐ Internal requirement
- ☐ External requirement
- ☐ Both of them
- ☐ Others (please specify).....

B9. Please indicate whether your ministry procure online using the following procurement methods

Online procurement and procurement methods	Never	Rarely	Sometimes	Often	Very Often
Open tender					
Restricted tender					
Request for proposals					
Request for quotation					
Direct procurement					
Low level procurement					

B10. Indicate, on a scale of 1 to 4, how the adoption of e-procurement has been of importance under the following aspects, where 4 is to a very large extent; 3 is to a large extent; 2 is to a little extent; and 1 is to a very little extent

Important aspect	Very large extent	large extent	Little extent	Very little extent
Price reduction				
Improved contract compliance				
Shortened Procurement cycle times				
Reduced administration costs				
Enhanced inventory management				
Improved visibility of customer demand				
Reduced operating & inventory costs				
Increased accuracy of production capacity				
Enhanced decision making				
Improved market intelligence				

B11. To what extent do the following E-procurement Barriers limit the full implementation of an e- procurement system in all the processes in your ministry? Use a scale of 1 to 4 where 1 is to a very little extent; 2 is to a little extent; 3 is to a large extent and 4 is to a very large extent

Barrier	Very large extent	Large extent	Little extent	Very little extent
Security of transactions				
Lack of Supplier E-procurement solution				
High cost of technology				
Lack of legal framework				
Lack of technical expertise				
Lack of E-procurement knowledge				
No real business benefit identified				
Data exchange standards lacking				
Lack of business relationships with suppliers				
Attitude				

B12. Indicate, on a scale of 1 to 4 how often you carry out these tasks online, where 4 is very often, 3 is often, 2 is to rarely and 1 is to never

Procurement tasks	Never	Rarely	Often	Very often
Awarding Online				
Bidding Online				
Conducts MTC meeting electronically				
Contracting done electronically				
Invoicing done electronically				
Make payments electronically				
Posts bid results electronically				
Procuring Online				
Receive formal bids electronically				
Transmit PO electronically				
Vendor selection done electronically				

Section C: Drivers of E-procurement in the Kenya Public Sector

C1. On a scale of 1 to 4, please indicate how important the following drivers are in the adoption of e-procurement in the government in Kenya today where 1 is least important; 2 is a little important; 3 is important; and 4 is very important

Driver	Least important	A little important	Important	Very important
Process cost savings - (Tender / Purchase Process)				
Service / Material / Product Cost Savings				
Transaction Administration Cost Savings				
Enhanced Inventory Management				
Decrease in Costs through reduced staffing levels				
Shortened Overall Procurement Cycle Times				
Reduction in time through greater transparency (Less objections)				
Reduction in Evaluation Time				
Increased Quality through Benchmarking (Market Intelligence)				
Increased Quality through increased competition				

C2. Please indicate what you consider the most important driver from the above options.....

Section D: E-procurement Readiness in the Kenya Public Sector

D1. The public sector in Kenya is ready for a paradigm shift to e-procurement?

Strongly agree (4)

Agree (3)

Disagree (2)

Strongly disagree (1)

D2. What capacity, on a scale of 1 to 4, do the government ministries in Kenya have in readiness for a full shift to an e-procurement? Where 1 is to a very little extent; 2 to a little extent; 3 to a large extent; and 4 to a very large extent

Capacity	Very large	Large extent	Little extent	Very little
Institutional capacity- governance leadership, HR Management				
Governance-planning & management; legislation & regulation				
Business functionality and standards – infrastructure and web services; and standards				
Private sector involvement – private sector integration				
Application of technology through systems				

D3. Please indicate the most critical capacity e-procurement readiness aspects from the options.....

D4. To what extent do you agree with these statements about e- readiness in your ministry procurement structures On a scale of 1to 5 where 1 is to strongly disagree, 2 is to agree, 3 is to neutral, 4 is to agree and 5 is to strongly agree

E-readiness	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Staffs within the ministry are sufficiently ICT literate to support the introduction of e-procurement					
It is expensive to adopt e-procurement					
There is lack of knowledge about e-procurement adoption					
Benefits of e-procurement adoption are not good enough					
It is complex to adopt e-procurement					
E-procurement is cumbersome to use					
Mistakes are more difficult to get fixed when using e-procurement					
E-procurement creates the best way to purchase					
There is concern over security of data					
Data systems infrastructure-is ready					
Management systems, records and work processes is in place					
The legal infrastructure is ready					
Human infrastructure is ready					

Leadership and strategic thinking is ready					
Your organisation is ready for uptake of e-procurement					
E-procurement provides opportunities for hackers to paralyze firm operations					

Section E: E-Procurement Strategies available in Kenya

E1. Does the ministry have e-procurement strategy?

Yes [] No []

E2. The strategies that are in place are adequate enough in the implementation of e-procurement within my ministry

Strongly agree (4)

Agree (3)

Disagree (2)

Strongly disagree (1)

E3. To what extent are the following e-procurement strategies used in your parent ministry? Use a scale of 1 to 4 where 1 is to a very little extent; 2 is to a little extent; 3 is a large extent; and 4 is to a very large extent

Strategy	Very large	Large extent	Little extent	Very little
Slow step-by-step adoption where implementation is one piece of the system at a time and slowly bring trading partners on board				
Total replacement model where a totally parallel system is built, tested, then switch over to it when it works				
Parallel model				

E4. Select and rate how important, on a scale of 1 to 4, are the following critical success factors in the adoption of e-procurement in Kenya? Where 1 is very little importance; 2 is a little important; 3 is important; and 4 is very important

Select	Critical Success Factor	Very important	Important	Little important	Very little important
	End-user uptake and training				
	Supplier adoption				
	Compliance with best practices for business case/ project management				
	Security and authentication				
	Re-engineering the process				
	Top management support				
	Performance measurement				
	Change management				
	E-procurement implementation strategy				
	Technological standards				

E5. On a scale of 1 to 5 where 5 is to strongly agree, 4 is to agree, 3 is neutral, 2 is to disagree and 1 is to strongly agree to what extent do you agree with these statements about procurement structures in your organization?

Procurement structures	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
There is a functional procurement department					
The procurement department has clear roles and responsibilities					
The procurement department has its own budget					
There is a qualified head of procurement					
The head of procurement reports to the chief executive					
Procurement staffs are encouraged to develop their own procurement-related skills and expertise					
Procurement staffs can be trained on procurement related training qualifications					
ICT infrastructure can be availed easily to the procurement staffs					
You benchmark your procurement efficiency and effectiveness					

Thank you for your cooperation

END

INTERVIEW PROFORMA

1. What is your name sir/madam? _____
2. How long have you worked in this ministry? _____
3. What is your profession? _____
4. What is your current position/title? _____
5. How long (years) have you applied e-procurement in your organisation? _____
6. What is the current e-procurement strategy approach of your organisation?
☐ Slow step-by-step adoption where implementation is one piece of the system at a time and slowly brings trading partners on board
☐ Total replacement model where a totally parallel system is built, tested, then switch over to it when it works
☐ Parallel model
7. Are the strategies in place adequate enough in the implementation of e- procurement within your ministry?
Strongly agree (4)
Agree (3)
Disagree (2)
Strongly disagree (1)
8. The decision to adopt e-procurement is based on?
☐ Internal requirement
☐ External requirement
☐ Both internal and external

9. What are the challenge(s) of adopting e-procurement in your organisation are?

☐ Attitude of the staffs ☐ ICT Infrastructure and Lack of information security

☐ Existing Laws and Regulations ☐ Suppliers ☐ Training

☐ Financial ☐ Others (please specify).....

10. Based on your experiences what are the merits of applying e-procurement?

Price advantages ☐

Decreased procurement cycle times ☐

Decreased transaction and administration expenditure ☐

Decreased costs of operating and stock ☐

Quick decision making ☐

11. How will you rate the e-procurement adoption in your ministry?

Very successful (4)

Successful (3)

A little successful (2)

Not successful at all (1)

12. How will you rate the e-procurement policy in your ministry?

Strongly favourable (5)

Favourable (4)

Uncertain (3)

Unfavourable (2)

Strongly unfavourable (1)

13. What will you recommend for the improvement of e-procurement in the Kenya public sector?_____

14. Is there anything you would like to add to this topic? _____

Thank you for your cooperation

END

APPENDIX C: LIST OF MINISTRIES IN KENYA

S/No	Ministry
1	Ministry of Agriculture
2	Ministry of Co-operatives Development
3	Ministry of Development of Northern Kenya & other Arid Lands
4	Ministry of East African Community
5	Ministry of Education
6	Ministry of Energy
7	Ministry of Environment and Mineral Resources
8	Ministry of Finance
9	Ministry of Fisheries Development
10	Ministry of Foreign Affairs
11	Ministry of Forestry and Wildlife
12	Ministry of Gender and Children Affairs
13	Ministry of Higher Education, Science Technology
14	Ministry of Home Affairs
15	Ministry of Housing
16	Ministry of Industrialization
17	Ministry of Information and Communication
18	Ministry of Justice, National Cohesion and Constitutional Affairs
19	Ministry of Labour
20	Ministry of Lands
21	Ministry of Livestock Development
22	Ministry of Local Government
23	Ministry of Medical Services
24	Ministry of Nairobi Metropolitan Development
25	Ministry of Public Health and Sanitation
26	Ministry of Public Works
27	Ministry of Regional Development Authorities
28	Ministry of Roads
29	Ministry of Special Programmes
30	Ministry of State for Defence
31	Ministry of State for Immigration and Registration of Persons
32	Ministry of State for National Heritage and Culture
33	Ministry of State for Planning, National Development and Vision 2030
34	Ministry of State for Provincial Administration and Internal Security
35	Ministry of State for Public Service
36	Ministry of Tourism
37	Ministry of Trade
38	Ministry of Transport
39	Ministry of Water and Irrigation
40	Ministry of Youths and Sports
41	Office of the President
42	Office of the Prime Minister

APPENDIX D: DIVERSE INFORMATION TECHNOLOGY ADOPTION

DIVERSE INFORMATION TECHNOLOGY ADOPTION MODELS						
References	Stages/Phases					
Change Model (Lewin, 1952)	Unfreezing		Change (or Moving)		Refreezing	
Organisational Innovation Model (Pierce and Delbecq, 1977)	Initiation		Adoption		Implementation	
Four Phase Innovation Adoption Process (Darmawan, 2001)	Initiation	Adoption		Implementation	Evaluation	
Stages of Innovation Adoption (Becker and Whisler, 1967)	Stimulus	Conception		Proposal	Adoption Decision	
The Research Model (Agarwal and Prasad, 1998)	Awareness		Perception		Adoption Decision	
	Channel Type		Personal Innovativeness			
Organisation Innovation Adoption (Frambach and Schillewaert, 2002)	Awareness	Consideration	Intention	Adoption Decision	Continuous Use	User Acceptance
Innovation Adoption and Implementation (Gallivan, 2001)	Primary Authority Adoption Decision		Secondary Adoption and Organisational Assimilation		Organisational Acceptance And Consequences	
Innovation Adoption (Rogers, 1995)	Knowledge of Innovation	Attitude towards Innovation		Adoption Decision	Implementing Innovation Idea	Confirmation of Decision
IT Adoption Model (Dixon, 1999)	Analysing Requirements & Assessing Capabilities	Analysing Fit of Technology	Adoption Decision		Accept for Utilisation or Upgrade Capabilities	
					Rejection	
Technology Acceptance Model (Davis, 1989)	Investigating the External Variables	Perceived Usefulness Perceived Ease of Use	Attitude Towards Technology		Behavioural Intention for Technology Acceptance	Actual System Accepted and in Use
Two Stage Innovation Adoption Model (Zaltman et al. 1973)	Primary Adoption			Secondary Adoption		
	A Firm Level Decision for Technology Acceptance			Actual Innovation Implementation and including Individual Adoption by Users		

Source: Pudjianto and Hangjung (2000)