

ELECTRONIC PROCUREMENT ADOPTION: THE CASE OF KENYA PORTS AUTHORITY

By

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Requirements for the Award of Master of Business Administration
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DECLARATION

This management research project is my original work and has not been submitted for a degree qualification in any other university.

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DEDICATION

This work is dedicated to God the Almighty for giving me the strength to carry on. Also special thanks goes to my mother Dorothy Sidi whose love and support has made me what I am today. To my late dad Julius Katana this research is dedicated to you and the seed of education that you planted in the family is still growing and I believe you are happy.

ABSTRACT

The supply chain of any organization is a vital component of the whole business cycle. The maritime sector and KPA in particular is not an exception to this regard. This sector offers employment both directly and indirectly to a vast majority of residents in the entire eastern and central African region. The increasing significance of technology in the supply chain is of paramount importance to the performance of any organization.

The overall objective of the study was to determine the factors that influenced the adoption of e-procurement at KPA and its associated benefits and challenges. This study was guided by various theoretical reviews. This was a case study research. The study had a total population of 94 procurement personnel at KPA.

The study used primary data which was collected using questionnaires and interview guide. Descriptive and factor analysis was used to analyze the quantitative data while content analysis was used to analyze the qualitative data. The study found out that value for money and reduction of corruption and corrupt practices as among the driving factors for e-procurement adoption at KPA. The benefits include enhanced transactional speed, overall process cost reduction, shorter procurement cycle times, ease of process monitoring and audit as among the benefits while the sharing of passwords among suppliers and their resistance to learn and embrace new technology as among the greatest challenges.

In light of the findings, the study recommends that since KPA has successfully adopted e-procurement, there is need to focus on web security issues, web uptime tracking and supplier (external users) password control measures as these seem to be the major challenges prohibiting the organization from fully achieving its goals. E-procurement

adoption at KPA has enabled the organization to redesign and improve business work processes radically but there is still need for initiatives that emphasize incremental improvement in the whole e-procurement process and output to cope with changes in the ever changing business environment.

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LIST OF ABBREVIATIONS

B2B	Business-to-Business
B2C	Business-to-Consumer
B2G	Business-to-Government
CBS	Community Based System
EDI	Electronic Data Interchange
E-Mail	Electronic Mail
E-Procurement	Electronic Procurement
ERP	Enterprise Resource Planning
I T	Information Technology
ICT	Information and Communication Technology
IDT	Innovation Diffusion Theory
KPA	Kenya Ports Authority
KMO	Kaiser-Meyer-Olkin
MRO	Maintenance, Repair and Operations
MRP	Manufacturing Resource Planning
NSE	Nairobi Stock Exchange
SAP	Systems Application Products
SCM	Supply Chain Management
UK	United Kingdom

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CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Today most organizations are increasingly and mostly doing business using information technologies and the Internet. The rapid and intense growth of competition in the market environment and the consequent changes in the economic conditions have forced organizations and business firms to implement new technologies in order to stay competitive. One of the main business areas that have been influenced by the internet is e-procurement which usually represents one of the largest expense items in a firm's cost structure, (Lennon, 2002; Kalakota and Robinson, 2001).

Presently, organizations do not ask why they should adopt e-procurement; instead, they ask how to do it in a way to get the maximum benefits that they can. The need for change in procurement has been driven by a combination of the issues noted with traditional procurement as well as the need for public sector organizations to deliver sustainable competitive advantage as global markets become more competitive. According to Presutti (2003), there is an evident shift from the typical focus of purchasing, where price and availability were the key factors to be considered, to a more strategic view of procurement including a comprehensive understanding of target costing, supplier development and e-procurement.

Min and Galle (2003), define e-procurement as 'the business-to-business procurement practice that utilizes e-commerce to identify potential sources of supply, to purchase goods and services, to transfer payment and to interact with suppliers'. E-procurement is part of the wider supply chain management and this has moved from the low profile ancillary concern to a recognized strategic component with tangible positive impact on

the organizations bottom line. Farzin and Nezhad (2010), assert that e-procurement practices include activities such as advertising of tenders, electronic ordering, research into supplier markets, internet sourcing via third parties, and electronic submission of tenders, electronic mail between buyers and seller and in contract management.

One of the major requirements in any supply chain in which all concerned parties are scattered all over is the high speed transfer of data between them. Many organizations tend to waste time on non-value adding activities in their supply chains. According to Turban, King, Lee and Viehland, (2006) activities such as data entry, correcting errors in paperwork, expediting delivery, solving quality problems are among the time wasters in procurement processes. In order to achieve competitive advantage, e-commerce and e-business are focal points for all stakeholders in the marketplace, (Porter, 1980).

1.1.1 The Concept of E-Procurement

Panayiotou, Gayialis and Tsatsipoulos (2004), define e-procurement as the use of information technologies to facilitate business to business (B2B) (or B2C or B2G) purchase and payment of goods and services. According to Moozakis (2001), business firms that do not embrace technology at the opportune time are at the risk of losing customers or suppliers. The transportation industry in general and the maritime sector in particular are not an exception to this regard.

In the information age, e-procurement is an important topic. Why? Arguably, because it is of a strategic importance to organizations, and presents a central part of any changes, which have to be executed for Web strategy support. According to Archer and Gebauer (2001), with e-procurement, buyers and suppliers try to reduce costs and time, achieve error reductions while executing business quality improvements. It is suggested that there

are key opportunities for effective and efficient e-procurement to bring about improvements in business processes. E-procurement promises great opportunities for closer relationships between buyers and suppliers.

Given the potential of using the internet and other web-enabled technologies to revolutionize the procurement process (Kotzab 2006; Sanders 2007), numerous companies worldwide are using e-procurement in an attempt to leverage on this technological infrastructure. In terms of e-commerce as a business strategy, e-procurement is normally considered the starting point for many companies' overall e-commerce strategy Chang, (2004).

Government procurement accounts for a substantial part of the global economy and is estimated to involve 10 to 15 percent of GDP in developed countries, and up to 20 percent in developing countries, (World Bank, 2003). This depicts how the quality of procurement is very crucial in any economy and therefore many governments endeavor to make procurement processes simple, transparent and efficient. Most of the countries in the developing and developed economies more or less, share uniform concerns about procurement policies to ensure the processes are efficient, transparent and attain the stated objectives. To reduce inefficiencies in a supply chain, organizations are increasingly using information systems to integrate the systems and processes throughout the supply chain.

Prior research has confirmed that the integration of supply chain management systems has happened to a large extent in the US and European markets while e-procurement has a long way to go in developing nations like Kenya, Kiburi (2008). According to Moozakis (2001), E-procurement is the fastest-growing software segment, followed by

customer relationship management, supply chain management, and enterprise resource planning. Early adopters of e-procurement have reported lower costs of goods and services purchased, lower inventory levels, shorter lead-times, and improved communications with suppliers.

Over the years, some research has been done in this area; locally, Kiburi (2008) did a research on Factors Influencing the Implementation of e-procurement among firms listed on the Nairobi Stock Exchange. In this the researcher found out that the companies listed in the NSE implement e-procurement so as to enhance efficiency and control in the supply chain, improved communication with suppliers, transparency and increase enhanced contract compliance. Internationally, research conducted by McConnel (2009) on the factors affecting the uptake of applications of e-procurement, within the UK public sector revealed that there is absence of comprehensive and adequate research into the relationship between technology, process, people and compliance factors and the level of technology adoption. Locally little research has been conducted on the e-procurement adoption in state corporations.

1.1.2 The Kenya Ports Authority

According to the KPA website (2011), The Kenya Ports Authority (KPA), here in referred to as “The Authority” was formed through an act of parliament in 1978 following the collapse of the East African Community and it is responsible for all aspects of national port development and operations. The Authority’s mandate is to maintain, operate, improve and regulate all scheduled seaports situated along Kenya’s coastline.

According to Osero (2009), the strategy of making the port an E-port portrays the ambitious strategies in its ICT policies. KPA has now fully integrated an ICT strategy

with ERP system, water-front system, and a community based system (CBS) which was recently introduced. The CBS is a flexible automated information sharing resource that will link the port community users via electronic means to allow secure exchange of authorized data between partners.

KPA is attempting to automate the purchase of goods and services from multiple suppliers. This is because the data relating to buying, auctions, market inquiries, quotations, purchase orders, shipping and dispatch details and invoicing are done using mailed hard copies, e-mails and fax. This data is sent in various formats including Word, Excel, and so on. In its 2009/2010 financial year, KPA decided to implement e-procurement so as to gain from online connectivity with key suppliers, provision of paperless buying, and electronic generation of requests from quotations and subsequent receipt and analysis of quotations.

According to Ndua (2009), ports have become more important than ever before because of the peculiarity role they play in economic development and their role as centers of focus in terms of management at the national or regional governments. The rapidly changing port environment, economically, socially, technological and institutionally, has put a lot of pressure on port authorities to redefine their role and goal in facing new challenges and develop new capabilities.

For ports to operate efficiently and give the best output, they must have effective supply chain management systems. According to Osero (2011), African ports must deal with apparent weaknesses in the supply chains in order to play the significant role in economic development and as centers of focus in terms of management at the national or regional governments. Research by Archer and Gebauer (2001), on e-procurement reveals that e-

procurement systems presents key opportunities for effective and efficient supply chains in order to bring about great improvements in the entire business process.

1.2 Statement of the problem

Novack and Simco (1991) assert that e-procurement studies are particularly important due to the fact that procurement is one of the most critical functions of supply chain. Overall, it is clear that e-procurement is still in early stages of adoption in the corporate world. However a study by Davila, Gupta and Palmer (2003), reveals that there are encouraging indications of e-procurement wider adoptions as more firms come forward with their pioneering implementation experiences and as more and more firms take internet –enabled supply chain management initiatives more seriously.

Several studies have examined the e-procurement practices and benefits to organizations Wyld (2004). A study by Chipiro (2009), on the impact of e-procurement on strategic sourcing a case of CBZ bank limited Zimbabwe, found out that price reduction, improved market intelligence and market share are the major drivers for e-procurement adoption. However her study identified lack of management support, inadequate IT infrastructure and company culture as the major barriers to uptake e-procurement.

Locally, Kiburi (2008) conducted a research on factors influencing the implementation of e-procurement among firms listed on the NSE. She found out that the companies listed in the NSE implement e-procurement so as to enhance efficiency and control in the supply chain, improved communication with suppliers, transparency and increase enhanced contract compliance.

To the best of the researcher's knowledge, no study has been carried out on the factors influencing e-procurement adoption and its associated benefits and challenges at KPA.

Research on efficient port supply chain is significant because of the peculiar role of ports in economic development and procurement efficiencies speak volumes in terms of improved exports and imports or trade for the entire region. This study therefore intends to address this knowledge gap.

The researcher therefore poses the following questions; what are the factors that influenced e-procurement adoption at KPA? What are the benefits that KPA may derive in digitizing its procurement processes? What challenges is KPA likely to face in e-procurement implementation?

1.3 Objectives of the study

This study sought to focus on e-procurement adoption at KPA and was guided by the following research objectives:

- i. To determine the factors that influenced e-procurement adoption at KPA.
- ii. To establish the benefits of e-procurement adoption at KPA.
- iii. To determine the challenges of e-procurement adoption at KPA.

1.4 Importance of the study

a) Theoretical Contribution

This study will act as a reference point to other researchers in the same field as it is directly linked to the current interest in new technology adoption in the public sector and to Kenya Ports Authority in particular.

b) Practical Contribution

This study will provide an insight to e-procurement practitioners on the e-procurement adoption, benefits and challenges. It will also provide vital information to business firms and state corporations on how best e-procurement can be adopted and how to mitigate the expected challenges. It is intended to help in the identification of new technology adoption and the challenges and benefits organizations are likely to face. By gaining understanding of the most important e-procurement factors, organizations will have to organize themselves in a way that ensures success. With knowing such factors, organizations will be able to better prepare for e-procurement and thus operate successfully and be able to compete in the global market. For successful e-procurement implementation, organizations have to investigate these factors in detail.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter looked at the various theories that constituted and informed the study. A comprehensive theoretical review was carried out to guide the development of the most appropriate research methodology. The main areas under this include theoretical review on factors influencing e-procurement adoption, procurement, e-procurement, e-procurement practices, the challenges and benefits of e-procurement adoption.

The literature employed an interactive review of the institutional and the diffusion of innovation theories. On the institutional theory, according to DiMaggio and Powell, (1983) the institutional forces guide strategic changes in organizations, and this theory suggests that organizations adopt rules and practices that may not necessarily increase technical efficiency but do increase legitimacy in external stakeholders' view. This organizational legitimacy in the case of IT adoption depends upon the pressure exerted by trading partners and stakeholders as stipulated by Abrahamson and Rosen Kopf (1983). As such, organizations may concede to the pressure exerted by trading partners and stakeholders to obtain legitimacy, and this may also be true in the case of e-procurement adoption.

The Innovation Diffusion Theory (IDT) and the Technological factors postulate that the adoption of e-procurement initiative is purely an issue of technological diffusion and adoption of procurement innovation. According to Rogers, (1995) this theory can be used to understand e-procurement assimilation as it has been used extensively as a theoretical base of innovation adoption research in the field of information systems.

2.2 E-Business

E-business is defined as the marriage between the Internet and supply chain integration. This marriage is transforming many processes within the supply chain from procurement to customer management and product design (Johnson and Whang, 2002). Business around the world have revolutionized with the advent of the internet, where the electronic commerce is the way of conducting business transactions. With the emerging globalization of the economy, e-business and e-commerce have increasingly become a necessary component of business strategy and a strong catalyst for economic development, (Croom, 2000). Driven by the ever-challenging market conditions, many business organizations are carefully reexamining the existing business processes and practices and seeking for opportunities to improve, particularly in the area of procurement.

However, before the usage of the Internet, e-procurement has existed before through the use of electronic data interchange (EDI) and value-added networks. Also enterprise resource systems such as SAP and Oracle have standard components for handling procurement activities. The integration of information and communications technology (ICT) in business has revolutionized relationships within organizations and those between and among organizations, buyers and suppliers. As electronic media become widely available in increasing number of African and Asian countries, their use in public procurement is rising.

Over the years procurement process has become a costly activity for businesses organizations. These processes often involved slow manual business procedures and even slower systematic methods for handling procurement operations. This was forcing most

of the purchasing officers to handle errors in ordering, costing and invoicing; which were time consuming and very costly to trace. Procurement is not only a strategic player in the value chain, but a major driver in the extended supply chain, (Kalakota and Robinson, 2001). Attracted by efficiency and convenience, an increasing number of business bodies are using the internet to conduct business transactions. This has opened many avenues for the creation of new business processes, including electronic procurement systems, which are supplanting those used traditionally by many business organizations.

The public sector demands highest integrity in procurement. One of the components of e-business that help revolutionize supply chain activities is e-procurement. Procurement of goods, works, and services through the internet-based information technologies (e-procurement) is emerging worldwide with the ability to reform processes, improve market access, and promote integrity in public procurement. The major types of e-procurement are: Web-based Enterprise Resource Planning (ERP)-creating/approving purchasing using Web technology; e-sourcing-identifying suppliers using Internet technology; e-tendering-sending requests for information and pricing to suppliers and receiving responses using internet technology.

Much of the hype associated with the impact of electronic business is associated with cost savings and efficiencies can be greatly achieved through the utilization of e-procurement. Supply chain management involves all the approaches that are used to efficiently and effectively integrate the supply-side participants of a firm's value chain (Porter, 1980) for products and services to be delivered to the customer in the right quantities, to the right location, at the right time, and at optimal costs. Effective supply chain management among business partners can eliminate excess inventory, reduce lead times, increase sales and improve customer service (Anderson and Lee, 1999). The application of information

systems (IS) technology in the integration process is a concept that is receiving managerial attention and, consequently academic research interest. Most organizations are deploying best practices such as using the Web to provide suppliers with flexible yet secure access to their inventory systems.

A study by Killen and Kamauff (1995), shows that organizations are spending at least one-third of their overall budget on procurement products and services. According to Moozakis (2001) investments in procurement technologies account for the greatest percentage (53 percent) of business investment in enterprise applications software, followed by customer relationship management (41 percent), SCM (31 percent), and electronic resource planning (8 percent).

2.3 Procurement

The academicians' interest on procurement started from the analysis of US procurement processes practiced by the Department of Defense (DOD) during the early part of the cold war. Peck and Scherer (1962) did an analysis of the Economic impact of procurement and coincidentally both the academician and the economic studies done were on the US defense procurement. The importance of procurement has been enormous since then in both the private and the public sector of any economy.

According to Attaran (2002), procurement and e-procurement can be generalized into three categories; indirect procurement which is of non-production goods and services such as, office and computer supplies, maintenance repair and operating (MRO) supplies. Direct procurement which is of production goods and services such as raw materials, components and assemblies. Sourcing also as a form of e-procurement involves the identification of potential supplier and the evaluation and negotiation of goods and

services for both direct and indirect materials in the supply chain. This has not been automated in many organizations hence increased material costs and significant maverick spending. In recent times e-procurement of MRO goods is getting widely used.

The procurement and supply activity of organizations is one which spans both internal service and B2B services. This is an important activity found in all organizations, public, private, governmental and charities and can be responsible for a large amount of spending. Such spending on, for example, materials components, facilities, subcontract capacity, IT equipment and supplies, consumables, stationery, travel and insurance can constitute a significant amount of money, Moozakis, (2001).

This procurement process involves a series of activities aiming at striking the best deal in terms of price and quality. This process can range from: strategic buying which is mainly concerned with long term relationships between customers and suppliers. Transactional buying which implies repetitive purchases with the same vendor; spot buying whenever urgent requests come out and all the pre-qualified suppliers are not capable or are late in fulfilling them.

2.4 E-Procurement

While a number of e-procurement definitions exist. Presuti (2003), defined e-procurement as “A technology that facilitates corporate buying using the internet.” Min and Galle (2003) define e-procurement as “Business-to-Business procurement practice that utilizes electronic commerce to identify potential sources of supply, to purchase goods and services, to transfer payment, and to interact with suppliers”. The term E-procurement according to Heizer and Render (2000) refers to the use of the internet to buy and sell products and information. It has been defined as the use of information

technologies to facilitate B2B purchase transactions for materials and services and services (Wu et al., 2007). Definitions of E-procurement vary across literature; but the definition by Min and Galle (2003) is the one that will be adopted for this research due to its comprehensiveness.

Automating and distributing transaction processing into the hands of employees frees the procurement team to do more value-added work. The emergence of e-procurement makes use of new tools such as reverse auctions, global sourcing, aggregated volumes, and fast inexpensive communications, enabling more companies to implement best practices and save money. Despite the claimed business benefits that can accrue from implementing and embracing E-procurement, the extent of adoption in Organization for Economic Co-operation and Development (OECD) countries has slow progress and performance is below expectations, Pires and Stanton (2005).

The major types of e-procurement according to Croom (2000) are: Web-based Enterprise Resource Planning (ERP) which is the creation and or approving purchasing using Web technology, e-sourcing which is the identification of suppliers using internet technologies and e-tendering which is the sending of requests for information and pricing to suppliers and receiving responses using the Web. E-procurement may include processes such as electronic advertising and submission of tenders, electronic ordering, and quotation. In the context of this study, e-procurement will be described as the purchasing of indirect goods via electronic tools.

A global electronic procurement (e-Procurement) report released by SPG Media Research in 2007 indicated that approximately 90% of businesses worldwide are now involved in

some form of e-Procurement. This research further highlights that key decision and policy makers are incorporating them into overall organizational cost reduction strategies.

The e-procurement systems in essence mirror the procurement process through the provision of two distinct, but connected, infrastructures-internal processing (via for example, corporate intranet) and external communication with the supply base (via, for example, Internet-based platforms) Croom (2000). The major difference is that such systems allow individual employees to order goods and services directly from their own PCs through the Web. Requests and orders are channeled through various forms of “hub” or database which acts as an online catalogue of specifications, prices and often, authorization rules. Such systems allow individual employees to search for items, check availability, place and track orders and initiate payment on delivery.

Some procurement heads view e-procurement as a threat as they claim it will remove some aspects of their jobs. Best procurement people will recognize it as an opportunity to develop their role and demonstrate value-addition through strategic supplier management, contract negotiation, running online auctions and working with suppliers to develop the range of products available. According to Noto, (2001) the importance of the procurement department within an organization has become increasingly important over the last 30 years. And the introduction of e-procurement should help to continue and propel this trend, as procurement professionals place greater emphasis on their strategic capabilities.

Electronic technologies and their application and usage within the supply chain range from simple automation of long-standing business practices to complex real-time processes. E-procurement is one of the critical competitive strategies to building and

sustaining competitive advantage in the business market, Johnson (2002). An e-procurement process include the processes in Figure 2.0.

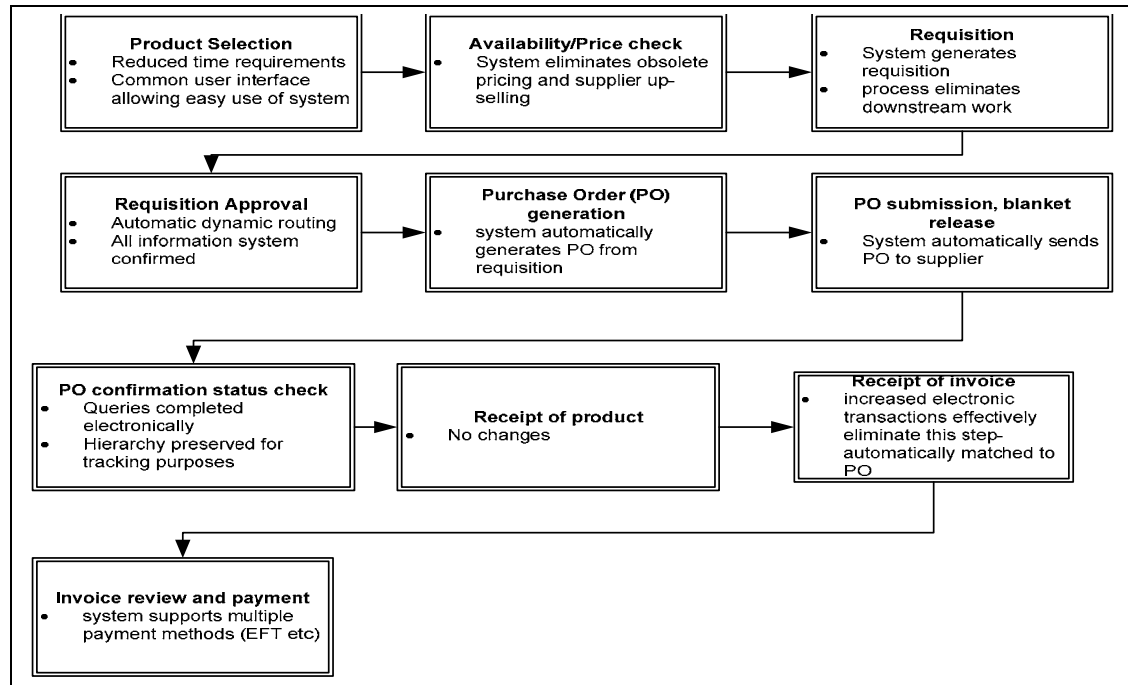


Figure 2.0 E-Procurement Processes. Source: Adapted from Chipiro (2009), The Impact of E-Procurement On Strategic Sourcing. A case of CBZ Bank Limited, Zimbabwe.

2.4.1 E-procurement practices

A research by Muffato and Payaro (2004), postulate that within e-procurement there are two main processes of procurement: procurement which includes specifications of the goods and services, notification of potential suppliers, tendering procedure, evaluation of tenders, agreement and acceptance and contract signature. The second part is fulfillment which include the activities of receiving the order, managing the transaction, delivery of the goods/services, acceptance of the goods/services, invoice and payment. Their research concludes by indicating that there is a potential spectrum of e-procurement

which include six practices; e-Notification which involves an organization notifying potential supplier of future tendering activity.

E-Tendering which encompasses an organization having the capability to electronically receive tender submissions from potential suppliers. They also identified e-Awarding which involves secure tender opening (e.g. being able to open tenders that have been submitted by the closing date, time). E-Contracting which involves the establishment of an agreement with a supplier and normally arises from e-notification, e-tendering and e-awarding stages or can arise from other technology solutions like e-auction which typically involves supplier bidding for the supply of goods based on a tender specification prepared by an organization. Unlike conventional auctions (where generally price increases), e-Auctions are commonly referred to as reverse auctions as the price quoted by supplier generally decreases.

Their research further concluded by adding e-Ordering and e-Invoicing. E-ordering is where an organization raises orders of agreed contracts or catalogues and there transmission and final acceptance by suppliers. Early e-procurement technology solutions focused on this aspect of e-procurement (e.g. EDI, e-catalogues and e-marketplaces) as this was perceived as the area where maximum efficiency could be achieved. E-invoicing is where invoices from suppliers are received electronically and further matching like with the purchase and goods received note is done, then the final payment is made. This wider and broader assessment of e-procurement by Muffato and Payaro (2004) not only define e-procurement but also reflect the need to automate the current and largely manual procurement processes of any organization.

Farzin and Nezhad (2010) asserts that e-procurement practices include activities such as advertising of tenders, electronic ordering, research into supplier markets, internet sourcing via third parties, electronic submission of tenders, electronic mail between buyers and sellers, electronic mail in contract management. Writers have classified e-procurement into three broad types;-transaction management to manage the requisition to payment process, brokerage such as using electronic exchanges and e-auctions, and electronic integration which may involve shared information systems in the supply chain, such as EDI or sharing computer aided systems (Kalakota and Robinson 2001).

However different forms of e-procurement have also been classified according to the various procurement activities; six forms emerged (de Boer, Harink and Heijboer, 2002). They include e-ordering/e-Maintenance Repair Operate (MRO), web-based enterprise resource planning (ERP), e-sourcing, e-tendering, e-reverse auctioning/e-auctioning and e-informing.

2.4.2 The enhancing factors of e-procurement adoption

Despite the great benefits of e-procurement technologies, their adoption is still at their early stages (Davila et al. 2003). A variety of factors may affect a firm's decision to adopt and implement a particular ICT. In consolidating prior studies examining innovation, Kwon and Zmud (1987) classified variables that potentially influence ICT adoption into five broad categories: individual, task and innovation related, organizational and environmental characteristics. Patterson et al. (2003) also showed that the following organizational and environmental factors positively affected the adoption of ICT in SCM: organizational size; decentralized organizational structure; supply chain strategy

integration; transactional climate and supply chain member pressure, and environmental uncertainty.

Kwon and Zmud (1987), also suggested that these factors may be important to differing degrees depending on the context or technology. For example, individual factors such as age or education are often more relevant with individual adoption of technology rather than organizational innovation whereby decisions are made by committees. Additionally, task characteristics may be isolated and examined when individual technologies are being studied. As this study examines the organizational adoption of e-procurement systems, the focus is limited on the following key organizational, innovation-related and environmental factors.

According to Bellaaj et al. (2008), external pressures exerted by competitors, customers, business partners, the media and the larger public itself can force firms to adopt technological innovations. This shows that competitors, suppliers and customers can exert direct or indirect pressures on organizations to adopt e-commerce. The size of the enterprise appears to be a determining variable in the adoption decision. According to Ling (2001) and Teo and Tan (1998), the small size of an enterprise is an important factor, as it can hinder adoption of Internet technology. Small enterprises are less apt to adopt e-commerce because they often lack resources, a situation brought about by such factors as operating in a strongly competitive environment, major financial constraints, lack of professional expertise and greater sensitivity to external forces (Thong 1999).

The type of business enterprise also influences the adoption of electronic commerce. For instance, Teo and Tan (1998) studied the relationship between various types of businesses (governmental, local or foreign organizations; characteristics of products,

number of product categories, and so on) and adoption of the Internet. According to these researchers, these variables – size, as well as the enterprise's types of activities – have an influence on the adoption of e-commerce (Filiatrault and Huy 2006). They further assert that adapting to new technologies may require changes in the work attitudes of employees, as well as their qualifications, their level of performance and the extent of their knowledge of e-commerce technology.

Teo and Tan (1998) have stated that one of the main reasons for not adopting the Internet is lack of internal expertise. Thus, an employee's knowledge of e-commerce has an effect on an organizations' ability to adopt ecommerce. In keeping with this, many organizations have attempted to delay the adoption of an innovation or new technology until they have acquired sufficient internal expertise (Thong, 1999). Correspondingly, if employees already know about e-commerce, then an organization may be more disposed to adopting it.

In addition, managers with ICT knowledge also have an effect on the adoption of e-commerce within a company (Thong & Yap, 1995), and this also has a positive influence on the degree of company e-commerce use. The literature is divided regarding the amount of influence that market competition has on the Uptake of e-commerce adoption within companies. For instance, whilst Filiatrault and Huy (2006) argue that the intensity of competition contributes to adoption of e-commerce by business organizations, Thong (1999) found that competition influences the adoption of new technologies or e-commerce to a very little extent in small enterprises. In contrast, Premkumar and Roberts (1999), state that the pressure of competition is a strong factor that influences adoption

and they assert that there is a relationship between the intensity of competition in an industry and the degree of adoption of e-commerce.

2.4.3 Challenges of e-procurement

While governments in their e-government strategies are encouraging public sector organizations to adopt e-procurement, its implementation does not appear to be smooth as supported by Steinberg (2003) who claims that ‘Government e-procurement projects have been notoriously unsuccessful’.

Various studies have been done to look into the challenges and difficulties faced by firms in launching e-procurement. Huber et. al. (2004), Saeed and Leith (2003), Yen and Ng (2002) assert that security concerns are a great challenge in e-procurement adoption and usage. The purpose of e-procurement is to reduce costs as well as improve operational efficiency in the procurement process. While this has happened to a large extent in the US and in European markets, e-procurement still has a long way to go especially in developing countries like Kenya.

Despite the many advantages, the implementation of an e-procurement system offers both for organizations and for the role of the procurement professional currently, very few companies are using e-procurement. One of the main reasons is that solution providers have approached e-procurement from a technological perspective, rather than a procurement perspective. This approach has a number of inherent problems not least because, as research among early adopters has shown, there is an overwhelming consensus that procurement professionals must be involved throughout the development process.

The internet has effectively removed restrictions allowing companies to be networked together at low cost, and it offers greater flexibility as the requirement for private networks are eliminated (Attaran, 2001). With the opening up of connectivity, a lowering in the security of data has also occurred and concern over security is a factor limiting the implementation of e-commerce systems (Croom, 2000). Suppliers and buyers are worried of risks from wrong products purchased due to incomplete and misleading information. They established that there is a risk of data confidentiality. This is the data that needs to be exchanged between or among firms. There are also privacy risks and trust issues emanating from inappropriate information transparency.

The benefits of e-procurement will not be evident when a solution provider is not able to communicate effectively with key decision makers, nor understand their particular needs and concerns. This is mainly because organizations believe they need to implement the whole system within their premises, an approach which requires enormous investment in software, hardware, altering the LAN infrastructure, consultancy, installation and integration, reorganizing the procurement department and coordinating the system with supplier technologies.

2.4.4 Benefits of e-procurement

Benefits of procurement are wide-range and become more prominent and evident when part or the whole process is automated through the web, (Min and Galle, 2003). Because e-procurement initiative is expensive, demanding upon staff, and time consuming, it may take several years for public sector agencies to fully reap the strategic and operational benefits. A wide range of e-procurement benefits have been reported as achieved, targeted or expected in the academic literature. These benefits are a result of reduced

paper transactions, shorter order cycle time and subsequent related information and enhanced opportunities for the supplier/buyer partnership using established B2B communication networks. There is a plethora of literature espousing the benefits of an e-procurement solution, Minahan and Degan (2001).

Leonard and Cochran (2003), assert that e-procurement benefits include; ability to implement 'Just In Time' strategy, streamlining of supply chain by removing of inefficient intermediaries, better access to information and transparency in markets and the removal of market barriers like time difference and geography. Schoenherr and Tummala (2007) did not look at benefits and their categories in their e-procurement review, but listed some of them, such as: reduced transaction costs, more efficient negotiation with, and identification of suppliers, workflow automation, organizational spending control and leverage, improved process monitoring, coordination and control, information sharing and integration.

According to Garrido et al., (2008), Dai and Kauffman (2006), the benefits of e-procurement are two-fold: economical and organizational. The promise of lower costs of goods and services purchased, lower inventory levels, shorter lead times, and improved communications has made Web procurement one of the hottest topics of e-commerce. Efficiencies and reducing costs for the acquisition and ongoing management of business expenditures, is estimated that a mid-size organization can expect to save almost US\$2 million annually through the use of e-procurement. (Attaran and Attaran, 2002).

According to Tavi (2008), e-procurement practices provide additional benefits which include: supplier selection where organizations can choose to procure from suppliers who comply with areas deemed important to the organization. These areas may include

vendors who comply with for instance green initiatives, ISO requirements or social responsibility. Supply performance management is also of consequence that e-procurement promises to deliver. These systems enable the organization to identify and manage the quality and performance of the suppliers so as to optimize their value to the organization. Also e-procurement offers advanced solutions which have a high degree of visibility and control which help protect an organization against fraud. Built-in approval and business rules and processes serve as preventive tools. These advanced e-procurement solutions provide real-time monitoring and audit trails of details.

The potentials of E-procurement have already been proved in a number of studies (Aberdeen Group, 2001). According to these studies, e-procurement enables companies to decentralize operational procurement processes and centralize strategic procurement processes as a result of the higher supply chain transparency provided by e-procurement systems. Significant operational benefits, such as the following can be gained: lower transaction costs; shorter procurement cycles, lower staffing requirements, reduced inventory levels; higher degree of transparency; and increased communication and collaboration between supplier and buyer companies, (Min and Galle, 2003), (Davilla et al., 2003). E-procurement also has key advantages in savings from group purchasing discounts, electronic efficiency, significantly faster turnaround times, streamlined shipment and delivery times, and electronic support of comparative pricing and purchasing.

Key researchers in e-procurement (Attaran, 2001; Minahan and Degan, 2001; Min and Galle, 2003; Presutti, 2003) have identified a number of key benefits which are cost related, these include reduced price of goods and services, reduced administration costs and reduced inventory costs. This potential of reduced costs or savings vary from sector

to sector depending on where the research was taken. These researchers also concluded that the benefit of supplier and buyer relationship improvement from e-procurement adoption in the manufacturing firms will lead to improved visibility of the supply chain and ultimately increased accuracy of production capacity. They also cited that e-procurement can bring a great improvement in relation to information management, financial management and contract compliance.

It is worth noting that the e-procurement benefits are not a guarantee as research has cited a number of failures. The failures in the public sector were reported in the UK, USA and New Zealand in recent years as these are the big players in e-business. These views are supported by Gifford (2003) which report that the New Zealand Government GoProcure e-procurement system has proved more complex to develop than expected, while the UK Ministry of Defence is yet to achieve savings three years after its e-procurement service first started running. According to Garson (2004), the state of South Carolina abandoned its e-procurement in June 2002 and pilot projects were shut down the same year in Massachusetts, Indiana, and Michigan.

2.5. Empirical studies

A study by McConell (2009) on the analysis into the factors affecting the uptake of applications of e-procurement, within the UK public sector revealed that there is absence of comprehensive definition and conceptualization of e-procurement. The study also showed that there is lack of understanding of the factors affecting the uptake of e-procurement by organizations within the UK central and Local government sectors and the lack of adequate research into the relationship between technology, process, people and compliance factors and the level of adoption.

Kheng and Al-Hawamdeh (2002) examined how e-procurement helps organizations in enhancing their competitiveness, and how to deal with challenges to its adoption. This study proved a general trend towards e-procurement adoption and a necessary tool enhancing a firm's competitiveness. They further ascertained that e-procurement as an enabler of supply chain integration and efficiency and at the same time provide significant cost savings to business firms. The main factor for e-procurement adoption is the promise of information technology as a tool for reducing overall purchasing costs.

In an endeavor to identify key challenges, benefits and business opportunities for e-procurement, Croom (2000), conducted a study which focused on the management of the procurement of non-core products and services. The benefits were categorized as operational and strategic benefits. The operational benefits relate to the capability to reduce administrative costs of the whole procurement process, and improve check and audit throughout the transaction process. Strategic benefits include greater opportunity to manage the total supply base and greater influence and control over expenditure by the procurement function.

Similar study by Kalakota and Robinson (2001) suggest the benefits of e-procurement as falling into two broad categories of efficiency and effectiveness. Benefits of efficiency include lower procurement costs, lower unauthorized buying, more highly organized information, lower cycle time, and tighter integration of the procurement function with the important back-office systems. Echoing the huge and numerous benefits firms stand to benefit on e-procurement adoption, Tassabehji and Moorhouse (2008) suggest that e-procurement enables volume purchase, a wider choice of buyers and suppliers, lower costs, better quality, enhanced delivery, and lower paperwork and administrative cost.

According to Cater (2001), a growing range of companies in the developing world are integrating the Internet in their business processes. A review of these empirical studies reveal that little research has been done on E-procurement in developing nations. This study wishes to explore the e-procurement adoption in developing countries and to find out the challenges and the likely benefits organizations stand to get. It also wishes to add to the slowly growing number of e-procurement research done and to give an insight for future research.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

The research design employed was a case study of KPA. Case studies try to pull together a wide variety of issues about the defined case, then present the information as a unified whole. This will enable the researcher to probe and make in-depth understanding and draw conclusions. According to Yin (2003), case study research is also characterized as qualitative and observatory in nature, using predefined research questions. Case studies emphasize on detailed contextual analysis of a limited number of events or conditions and their relationships. Thus it was deemed to be appropriate to achieve the objectives of this study as it allowed the detailed investigation of the contents of the study, in this case, electronic procurement adoption at KPA.

The research design utilized both qualitative and quantitative research methods which were complementarily used in order to have a more objective interpretation of the data. This combination of the methods will provide a rich portrait of the phenomenon under study. Gilmore and Carson, (1996) support this view and believe that the assignment of techniques between both approaches cannot only be beneficial but also of significant value to the research being undertaken. A research done by Vikiru, (2008) successfully used both approaches.

3.2 Population

The population for this research comprised all KPA employees involved in procurement and according to the KPA Human Resource Records; ninety four (94) employees were considered.

3.3 Data Collection

Primary data was used for this study. An interview guide was used to collect organizational factors and was administered individually to six (6) key e-procurement personnel at KPA. The six were considered key because of their level of involvement with the e-procurement adoption process and were considered to be adequately informed on the topic under study. The interview guide was selected as it gives an opportunity for the researcher to stimulate response to a greater extent given that the target population comprises of the personnel who are well versed with e-procurement issues at KPA. The interview guide does not restrict respondents on answers and has the potential of generating more information with much detail. This will generate qualitative data which will be used to uncover and understand what lies behind a phenomenon under study. A similar study conducted by Kashero (2008), successfully employed a similar approach.

A questionnaire was used to collect quantitative data that addressed the individual factors of e-procurement adoption at KPA. The questionnaire was administered to the eighty eight (88) personnel who are involved in procurement. This method of data collection is selected based on its suitability to collect feedback from the population. A 'drop-and-pick later' method was used in administering the questionnaire. This method was considered appropriate as respondents had the liberty to fill and give more information freely. The questionnaire was divided into two sections; Section A covered the demographic details while Section B covered the factors that influenced e-procurement adoption, the benefits of its adoption and the associated challenges.

3.4 Data Analysis

The data collected was edited for completeness, uniformity, accuracy and consistency. It was further coded to classify responses into meaningful categories to enable data to be analyzed. Descriptive statistics such as frequency distribution were used in order to examine the pattern of responses to each of the variables under description. Percentages, frequencies and arithmetic mean were used in order to facilitate comparison. Tables were used in presentation of data findings. A data reduction technique (factor analysis) was used to reduce the various dominant e-procurement adoption factors for easier and faster interpretation.

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.0 Introduction

This chapter presents the research findings. Out of a target population of 94 respondents, 64 usable questionnaires were received and analyzed, indicating a response rate of 68%. Mgendi (2010) achieved a similar response rate in his study. This study analyzed 29 factors that influenced e-procurement adoption at KPA, 28 factors for benefits and 20 factors for challenges of e-procurement adoption at KPA.

4.1 Demographic details

4.1.1 Age of participants

The study sought to establish the age bracket of each of the respondents. From Table 4.1.1, the study found out that 93.8% of the respondents were above 31 years indicating that the population under consideration was mature enough to give a reliable response.

Table 4.1.1 Age of participants

Age	Frequency	Percentage %
21-25	0	0
26-30	4	6.2
31-35	10	15.6
36-40	14	21.9
41-45	20	31.3
46-50	7	10.9
Above 51	9	14.1
Total	64	100

Source: Research data

4.1.2 Highest Level of education completed

The study sought to find out the highest level of education attained by the respondents. From Table 4.1.2 it was found out that 81.3% of the respondents had a minimum of diploma education. This reveals that the population under consideration was well informed to give the relevant and informed data. However, according to this particular study the age and individual factors don't have a high degree of influence in the organizational context of technology adoption Kwon and Zmud, (1987).

Table 4.1.2 Highest Level of education completed

Education Level	Frequency	Percentage%
Primary School	1	1.5
O Level/Form Four	6	9.4
A Level or Equivalent	5	7.8
HND/Diploma	22	34.4
Degree	18	28.1
Postgraduate/PHD	12	18.8
Total	64	100

Source: Research data

4.1.3 Current working position

The study also sought to know the current working position of the respondents. From the results, a bigger percentage (85.9%) was in the middle and senior management levels in the organization. Principal Officers, sectional heads and supervisors constituting 15.6%, 32.8% and 37.5% respectively as shown in Table 4.1.3. This cadre of staff is considered a knowledgeable group as it manages most functions in the organization. The data obtained was therefore relevant for the study.

Table 4.1.3 Current working position

Level	Frequency	Percentage %
Head of Division	1	1.5
Head of Department	3	4.8
Principal Officer	10	15.6
Section Head	21	32.8
Supervisor	24	37.5
Docker/Messenger	5	7.8
Total	64	100

Source: Research data

4.1.4 Length of service

The length of service of the respondents in terms of years worked was also important to the study. This was meant to ensure that the study involved people with enough experience who could give relevant information based on the experience they have. The findings as displayed in Table 4.1.4 show that 82.8% of the respondents had worked for more than 6 years by the time of the study. This is an indication that they had acquired enormous experience and could therefore be trusted as an authoritative source of information. This group of staff was also present during the conception and consequent adoption of the e-procurement process at KPA.

Table 4.1.4 Length of service

Length of Service	Frequency	Percentage%
Below 1 year	0	0
1-5 years	11	17.2
6-10 years	13	20.3
11-15 years	18	28.1

16-20 years	9	14.1
Above 20 years	13	20.3
Total	64	100

Source: Research data

4.1.5 Length of service at current working level

The study also sought to find out how long the staff had served in their current working positions. From Table 4.1.5, more than half (51.6%) had served in their current capacities for over six years. This shows that the respondents are well informed through experience on the job they are doing and are adequately resourceful.

Table 4.1.5 Length of service at current working level

Working level	Frequency	Percentage%
Below year	0	0
1-5 Years	31	48.4
6-10 years	22	34.4
11-15 years	6	9.4
16-20 years	4	6.3
Over 20 years	1	1.5
Total	64	100

Source: Research data

4.2 Factors that influenced e-procurement adoption at KPA

Twenty nine factors that influenced e-procurement adoption were subjected to analysis using both descriptive and factor analysis.

4.2.1 Descriptive analysis

In total, 29 factors were subjected to ranking and a likert point of scale was used, with the strongest factor scoring five points, whereas the least scored one point. The mean and standard deviation scores were computed as shown in Table 4.2.1. Among the factors which influenced e-procurement adoption at KPA, value for money was found to have the highest mean score of 4.38. The need for quick and timely information for decision making follows with a mean score of 4.18.

The next ranked component was the need to streamline the whole supply chain so as to remove unnecessary intermediaries which had a mean of 4.11. The others were the need to reduce paper work and its associated costs which had a mean score of 4.06, the need to have an equal opportunity to all suppliers in order to participate in a fair and transparent procurement process with a mean of 4.05. The least ranked of the factors for e-procurement adoption at KPA are; supplier preference for organization with e-procurement systems in operation, external pressures from stakeholders, the need to utilize the available funds within KPA budget, the need to reduce the number of procurement staff involved and the availability of donor funding for the e-procurement project having mean score of 2.88, 2.86, 2.83, 2.65, and 2.11 respectively.

Table 4.2.1 Factors influencing e-procurement adoption at KPA

Factors for e-procurement adoption	Mean	Std. Deviation	Coefficient of variation (%)
Value for money	4.38	1.06	24.2
Quick and timely decision making	4.18	0.81	19.4
Streamline supply chain	4.11	0.95	23.1
Reduce paperwork	4.06	0.98	24.1
Equal opportunity to suppliers	4.05	0.96	23.7

Competitive advantage	3.95	0.82	20.8
Successful adoption other i.t solutions	3.94	0.75	19
Eliminate queues	3.91	1.2	30.7
Match international business trend	3.91	0.95	24.3
Compatibility with other processes	3.91	1.02	26.1
Manual process was slow	3.89	1.06	27.2
Problem in handling many clients	3.78	1.12	29.6
Ease future reference	3.72	1.07	28.8
Company culture to upgrade innovation	3.71	1.1	29.6
Type of business activities	3.71	0.91	24.5
Stiff competition	3.69	1.1	29.8
Perceived savings	3.63	1.07	29.5
Corruption was high	3.62	1.23	34
Economic growth	3.59	0.9	25.1
Big organizational size	3.58	0.99	27.7
Government policies	3.43	1.12	32.6
Legal issues	3.31	1.13	34.1
Management attitude	3.31	1.17	35.3
Level of education	2.98	1.05	35.2
Supplier preference	2.88	1.35	46.8
External pressures	2.86	1.24	43.3
Utilize available funds	2.83	1.39	49.1
Reduce procurement staff	2.65	1.3	49.1
Donor funding	2.11	1.25	59.2

Source: Research data

4.2.2 Factor analysis

Further analysis was conducted to classify the various factors for e-procurement adoption at KPA into respective classes. The Bartlett's test of sphericity performed on these factors indicates that they are adequate for analysis. These factors had a KMO of 0.581 indicating that they were reliable for analysis, as shown in Appendix IV (d). Normally a KMO value of 0.5 and above is considered good for analysis Heir, Black, Babin and Anderson (2010). Seven broad categories of measures were identified after sixteen (16)

iterations, with a total component loading of 73.052. Table 4.2.2 shows the seven classes and the respective variables in each class.

The analysis indicates that, organizational targets, statutory benchmarks and best practices had the highest factor loading 7.145 followed by strategic response and economic growth with factor loading of 4.22. The need for procurement efficiency, speed and value money, business processes, competitive advantage and trend had factor loadings of 3.273, 2.783, 1.509, 1.413, and 1.343 respectively. This analysis enabled the grouping of all the 29 factors into 7 related factors and this shows that organizational business targets had a big influence and market trend had the least influence. These classifications are shown in table 4.2.2. A classification done in a study by Patterson, Grimm and Corsi (2003) did not show a significant difference from this.

Table 4.2.2 Classification of the factors influencing e-procurement adoption at KPA

Factors the influenced e-procurement adoption	Factor loadings	Sum of factor loadings
Factor one: Organizational targets, statutory benchmarks and best practices.		7.145
Big organizational size	0.948	
Level of education of employees	0.947	
Supplier preference for organization utilizing e-procurement	0.903	
Corruption level was high	0.820	
Donor funding	0.795	
Government policies(benchmarks)	0.690	
Stiff competition	0.687	
Perceived savings	0.570	
Reduce procurement staff	0.538	
External pressures from stakeholders	0.247	
Factor two: Strategic response and economic growth		
Competitive advantage	0.972	4.22

Successful adoption of other IT solutions	0.876	
Legal issues	0.828	
Ease of future reference	0.779	
Economic growth	0.765	
Factor three: Procurement efficiency and equality		
Manual procurement process was slow	0.925	3.273
Reduce paper work	0.871	
Wanted equal opportunity to all suppliers	0.766	
Streamline supply chain	0.711	
Factor four: speed and value for money		
Value for money	0.909	2.783
Quick and timely decision making	0.868	
Eliminate queues	0.788	
Management attitudes	0.218	
Factor five: Business processes		
Type of business activities/processes	0.842	1.509
Compatibility with other processes	0.667	
Factor six: Market response and demands		
Problem in handling large supplier	0.856	1.413
Match international business trends	0.557	
Factor seven: Trend		
Company culture to upgrade to new technology	0.867	1.343
Utilize available funds	0.476	

Source: Research Data

4.3 Benefits of e-procurement adoption at KPA

Twenty eight benefits for e-procurement adoption were subjected to analysis using both descriptive and factor analysis.

4.3.1 Descriptive analysis

The respondents ranking was analyzed by computing mean scores, standard deviation and the coefficient of variation for the twenty eight benefits listed. The respondents felt that enhanced transactional speed was the greatest benefit for e-procurement adoption with a

highest mean score of 4.43. This was followed by the need for cost reduction in paper work with a mean of 4.37.

There was a low dispensation in respondents' answers to the benefits of increased communication between buyers and suppliers, the enablement of e-government and greater savings from group purchasing discounts as they had a mean score of 3.43, 3.38, and 3.03 respectively. This shows that the adoption of e-procurement at KPA adds least value in the general enablement of the wider e-government strategy, and that group purchasing discounts are of no value to KPA as it procures centrally at the procurement department.

Table 4.3.1 Benefits of e-procurement adoption at KPA

Benefits of e-procurement adoption at KPA	mean	std. deviation	Coefficient of variation (%)
Enhance speed	4.43	0.71	16.02
Reduce paper work	4.37	0.88	20.14
Reduced transaction cost	4.35	0.69	15.96
Improve finance control	4.26	6.5	152.58
Better accuracy	4.23	0.77	18.1
Reduce corruption and corrupt practices	4.18	1.01	24.16
Ease of process audit	4.13	0.75	18.15
Low inventory levels	4.12	0.84	20.35
Transparency of procurement	4.12	1.02	24.75
Improved finance results	4.12	0.96	23.3
Improved monitoring	4.1	0.77	18.78
Shorten delivery	4.09	0.96	23.47
Shorter procurement cycle	4.09	0.95	23.22
Ease of reference	4.06	0.75	18.47
Enhance information sharing	3.95	0.91	23.03
Work flow automation	3.85	1.14	29.61
Freeing staff	3.81	1.22	32.02

Enhance supplier selection	3.8	0.87	22.89
Enhance corporate image	3.8	0.86	22.63
Maximize labor	3.7	1.04	28.1
Ensure on time delivery	3.67	1.24	33.78
Integration with back office	3.65	0.96	26.3
Improved communication between buyers and suppliers	3.63	1.08	29.85
Improve buyer supplier relationship	3.57	0.95	26.61
Improved contract compliance	3.54	1.09	30.79
Increase communication between suppliers and buyers	3.43	1.07	31.19
Adopt e-government	3.38	1.20	35.73
Greater savings from group purchase discounts	3.03	1.24	40.83

Source: Research Data

4.3.2 Factor Analysis

Further analysis was done using factor analysis with the aid of SPSS. The Bartlett's test of sphericity performed on these factors indicates that they are adequate for analysis Heir et al. (2010). These factors had a KMO of 0.724 indicating that they were reliable for analysis as shown in Appendix V (d). The results of factor analysis show that the benefits are categorized into six groups of related factors. The factors had a cumulative factor loading of 76.829.

The respondents identified themselves with transparency, efficiency and timeliness as the main benefit for e-procurement adoption at KPA. This had a factor loading of 6.332. The factor of supplier monitoring and benchmarks had a loading of 3.815 as other respondents associated themselves with supplier buyer relationship. The need for speed and accuracy, organizational focus, process audit, work integration and overall better output had a

factor loading of 2.475, 2.297, 1.683, 1.442 and 1.374 respectively. The results are shown in table 4.3.2.

Table 4.3.2 Classification of the benefits of e-procurement adoption

Benefits of e-procurement adoption at KPA	Factor loadings	Sum of factor loadings
Factor one: Transparency , efficiency and timeliness		6.332
Reduce paper work	0.872	
Reduced corruption and corrupt practices	0.794	
Ensure on time delivery	0.668	
Shorter procurement cycle	0.665	
Transparency	0.646	
Maximize labor	0.612	
Enhance information sharing	0.600	
Ease of reference	0.511	
Shorter delivery time	0.506	
Enhanced supplier selection	0.458	
Factor two: Supplier monitoring and benchmarks		
Adopt e-government	0.800	3.815
Improved buyer/supplier relationship	0.782	
Improved communication between buyer/supplier	0.776	
Improved financial control	0.772	
Greater savings from group purchasing discounts	0.685	
Factor three: Speed and accuracy		
Better accuracy	0.758	2.475
Reduced transactional cost	0.701	
Enhanced speed	0.550	
Freeing staff	0.467	
Factor three: organizational focus		

Work flow automation	0.829	2.297
Improved contract compliance	0.795	
Enhanced corporate image	0.673	
Factor four: Process audit		
Ease of process audit	0.900	1.683
Improved monitoring	0.783	
Factor five: work integration		
Integration with back office operations	0.748	1.442
Increase communication between buyers/suppliers	0.694	
Factor six: Better output and inventory management		
Low inventory level	0.855	1.374
Improved financial results	0.519	

Source: Research Data

4.4 Challenges of e-procurement adoption at KPA

Twenty challenges for e-procurement adoption were subjected to analysis. Descriptive analysis and factor analysis was used to analyze these factors. The challenges were ranked on 5-point likert scale with (1) representing strongly agree while (5) represents strongly disagree.

4.4.1 Descriptive analysis

The responses on the twenty challenges of e-procurement adoption at KPA were analyzed for mean, standard deviation and coefficient of variation as shown in Table 4.4.1. From the results in table 4.4.1, therefore, suppliers not interested in new technology adoption, supplier sharing passwords, lack of IT infrastructure for external users pose as the greatest challenges to e-procurement adoption at KPA with mean scores of 2.55, 2.62, 2.68 respectively. The least challenges were on the insufficient internal resources and lack of skilled procurement staff which had mean of 3.92 and 3.89 respectively.

Table 4.4.1 Challenges of e-procurement adoption

Challenges for e-procurement adoption at KPA	mean	Std. Deviation	Coefficient of variation (%)
Suppliers not interested in new technology	2.55	1.06	41.57
Suppliers sharing passwords	2.62	1.31	50.0
Lack of adequate technological infrastructure	2.68	1.28	47.76
Lack of data exchange standards	2.95	1.19	40.33
Internal end user resistance	2.95	1.18	40.0
Feeling unsecure when transacting online	3.04	1.08	35.52
Temporary unavailability of the system	3.07	1.17	38.11
Lack of robust business relationships with suppliers	3.17	1.12	35.33
Lack of government incentives on new technology	3.5	0.93	26.57
Expensive procurement system	3.52	1.16	32.95
Rigid company culture	3.52	1.14	32.38
High staff training costs	3.6	1.2	33.33
High implementation costs	3.6	1.18	32.78
Does not integrate	3.69	1.06	28.72
Lack of upper management support	3.75	0.98	26.13
Lack of legal framework	3.75	0.98	26.13
Lack of IT infrastructure	3.81	1.1	28.87
No business benefits identified	3.89	0.9	23.13
Lack of skilled procurement staff	3.89	0.95	24.42
Insufficient internal resources	3.92	0.8	20.4

Source: Research data

4.4.2 Factor analysis

The Bartlett's test of sphericity performed on these 20 factors indicates that they are adequate for analysis Heir et al. (2010). These factors had a KMO of 0.695 indicating that they were reliable for analysis as shown in Appendix VI (d). These factors had a cumulative factor loading of 66.980. As shown in Table 4.4.2, the factors fall into organizational, financial constraints, security issues, technological constraints and inadequate government support. The results show that they had factor loading of 3.203, 3.114, 3.035, 2.516, and 2.243 respectively.

Table 4.4.2 Classification of the challenges for e-procurement adoption at KPA

Challenges for e-procurement adoption at KPA	Factor loadings	Sum of factor loadings
Factor one: Organizational focus		
Rigid company culture	0.662	3.203
e-procurement does not integrate with other systems	0.660	
Lack of IT infrastructure	0.642	
Lack of skilled procurement staff	0.638	
Lack of upper management support	0.601	
Factor two: Financial constraints		
High staff training costs	0.847	3.114
High implementation costs	0.768	
Expensive procurement systems	0.761	
No business benefits identified	0.738	
Factor three: Security and technological issues		
Supplier sharing passwords	0.835	3.035
Persistent temporary system unavailability	0.812	
Feeling insecure when transacting online	0.776	
Suppliers not interested in new technology	0.612	
Factor four: Technological constraints		

Lack of data exchange standards	0.725	2.516
Lack of adequate technical infrastructure	0.654	
Lack of robust business relationship with suppliers	0.596	
Internal end user resistance	0.541	
Factor five: inadequate government support		
Lack of legal framework	0.866	2.243
Lack of government incentives	0.820	
Insufficient internal resources	0.557	

4.5 Content Analysis

E-Procurement adoption at KPA was planned in the year 2009. The process of its adoption was well implemented as the organization's management made a collective decision in consultation with the procurement department and agreed to adopt a more acceptable method of procurement. All the necessary legal and government requirements were adhered to especially in line with the Public procurement and Disposal Act 2005. The board of directors agreed on the adoption of e-procurement as they are mandated to have the final say.

Resistance was experienced especially from the suppliers. This was due to their reluctance to embrace new way of doing things. The suppliers were used to the manual process of operating and they were actually in their comfort zones and are used to the conventional mode of operating. To the suppliers, adopting this new method of procurement will distort their mode of operation.

Prior to e-procurement adoption, the suppliers were notified through a conference which was referred to as 'Supplier Conference' and was organized by KPA. This was a supplier sensitization conference which was organized basically to sensitize them on the need to adopt e-procurement and the benefits both parties stand to get.

Communication was made to the employees on the consequent adoption of e-procurement. A few selected personnel especially from IT department were trained on the e-procurement website development so as to accommodate the external users. The IT personnel are using their expertise to train the other staff and also the external suppliers on how to maximize on the website usage.

At the time of the study, KPA was in its advanced stages of sourcing for e-procurement software. Meanwhile most of the e-procurement is done through the KPA website and it was confirmed that e-tendering, e-quotation and e-awarding were among the e-procurement practices adopted. The major driving factors for e-procurement adoption at KPA were, the to get value for money on the procurement process, the need for equal opportunities to all suppliers as this new process would enhance transparency and accountability. This process eliminates the so called 'briefcase' suppliers thus presenting an equal chance to all so that tenders and contracts are awarded to the highest bidder not the highest briber.

The organization also wanted to reduce paper work and its associated costs thus speeding up the once slow, manual and tedious process. This frees up staff to do other work hence maximizing labor. The long queues experienced at the KPA offices by suppliers jammed the offices and the physical interaction between the suppliers and the procurement staff was compromising the entire procurement process. There was the need to streamline the entire supply chain in order to reduce inefficient intermediaries and thus minimize corruption and corrupt practices thus enabling the organization to maximize returns and get value for money.

The identified benefits for the adoption of e-procurement were enhanced transactional speed, the reduction of corruption and corrupt practices, the reduction of paper work and its associated costs. Other identified benefits include transparency, ease of process monitoring and audit.

The challenges highlighted in the study include lack of adequate technological infrastructure for external users and their reluctance to learn new technology. The suppliers are also sharing their password which makes it difficult to trace errors. It was also a challenge that most suppliers were feeling insecure when transacting online. The persistent unavailability of the system for online transaction was also an issue.

In tackling the above challenges, KPA is encouraging the end users (suppliers) to participate in defining their requirements so that the website can be custom made to suit these requirements. The suppliers are also trained on how to use the e-procurement website. The organization is also providing support to suppliers either over the phone or through physical visit to their offices in order to identify the problems they are experiencing in using the website. There is proper communication between the organization and the external user and mostly it's through the media and press on the downtime or the upgrade of the website so that suppliers may transact on time. This alleviates any inconveniences that may be caused.

The suppliers are also encouraged on the need to be abreast with new technological innovations in terms of software and hardware so that they may get the best from their investments. These new platforms support e-procurement fully and are cheap to install.

The suppliers are also sensitized on password management and protection so that they may not lose the same to would be fraudsters and thieves.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

A case study research was conducted to establish the e-procurement adoption at KPA, specifically to find out the factors that influenced its adoption and the associated benefits and challenges. Data was collected using questionnaire and the interview guide; Appendix I and II respectively.

This study had a response rate of 68% and this was considered sufficient for analysis. From the findings, 93.8% of the respondents were above 31 years of age and 81.3% had attained a minimum diploma level of education. This shows that the data obtained from the respondents was good and reliable for analysis. It was further established that 82.8% of the respondents have been with the organization for more than six years of service hence indicating that they were present when the idea of e-procurement was conceived to its subsequent adoption.

From the analysis of the 29 factors that influenced e-procurement adoption at KPA, value for money and the need for information for quick and timely decision were the drivers for e-procurement adoption at KPA while the need to reduce procurement staff and the utilization of donor funding were the factors that least influenced the adoption. These factors were further classified into seven broad categories which include, organizational targets, statutory benchmarks and best practices, strategic response and economic growth, need for procurement efficiency and equality, speed and value for money, enhanced business processes, market response and trend. Premkumar and Roberts (1999), on their

study identified competition as a contributing factor towards e-procurement adoption and this is not significantly different from the findings of this study.

Respondents identified themselves with speed, paperwork reduction, cost reduction and improved financial control. The enhancement of the wider e-government in the adoption of e-procurement at KPA and savings from group purchasing discounts were not of benefit to KPA. This can be attributed to the tendency of KPA doing procurement centrally and thus not enjoying any group discounts. Studies by Muffato and Payaro (2004), identified cost reduction and transactional benefits as among the benefits for e-procurement adoption which was not significantly different from the findings of this study. These benefits were further categorized into transparency efficiency and timeliness, supplier monitoring and benchmarks, speed and accuracy, organizational focus, process audit, work integration and better output and inventory management.

The challenges mostly associated with e-procurement adoption at KPA were externally related. The suppliers are not interested in learning new technology, the suppliers are least concerned with password protection issues and they lack the adequate technological infrastructure to utilize fully the potentiality of e-procurement. In her study Chipiro (2009), identified challenges which were not significantly different from the findings of this study. These challenges were further categorized into five broad categories of organizational focus, financial constraints, security and technological issues, technological constraints and inadequate government support.

5.2 Conclusion

The Kenya Ports Authority as a key player in the maritime sector adopted e-procurement in order to maximize value for money on its procurement process and reduce corruption and corrupt practices. It has attained this as it benefited in enhanced transactional speed, paperwork reduction and its associated costs, and reduced transactional costs. The greatest challenge for KPA on its endeavor to attain full potential of e-procurement lies with the external clients (suppliers). The suppliers are adamant in the uptake of this new technology as they are used to the manual conventional way of operating.

Therefore since for this case the attainment of greatest potential is two way then KPA should embark on sensitizing the suppliers on the need to invest in latest technology. The need to buy new technological infrastructure and the need to protect the users' passwords should be emphasized. Technological changes are inevitable and users have to embrace new technology in order to compete successfully in the dynamic business environment.

5.3 Recommendations

Though KPA has so far been successful with e-procurement adoption, there is need to focus on web security issues, web uptime tracking and supplier (external users) password control measures as these seem to be the major challenges prohibiting the organization from fully achieving the full potential of e-procurement. KPA is in the service industry and the external client plays a paramount role in the overall performance of the organization.

E-procurement adoption at KPA has enabled the organization to redesign and improve business work processes radically but there is still need for initiatives that emphasize

incremental improvement in the whole e-procurement process and output to cope with the ever changing business environment.

5.4 Suggestions for further research

Since this study used a firm that has been successful with e-procurement adoption, it would be interesting to study a firm that has not had good results with e-procurement adoption and much more a firm that has had disastrous results. Probably by so doing, the conclusions of the study would help in indicating to the approaches/tactics that don't work for new technology adoption. More insight could be derived from that and help in understanding some of the reasons that have led to some firms failing in new technology adoption.

The researcher proposes that a study be conducted to determine the extent to which e-procurement has impacted on the cycle times in an organization. A research can also be done to establish the relationship between e-procurement and organizational effectiveness. Another area of interest would be to find out if there is competitive advantage derived from e-procurement adoption since KPA is a monopoly in the local market.

Finally, this study is limited to the extent that its focus is on a specific country and industry/sector, Kenya and the maritime sector respectively. It is recommended that for a start, a similar study be undertaken within a region wide context and findings compared to the Kenyan context. This will provide a basis upon which the industry in Kenya can be rated for its e-procurement adoption against the other countries in the region.

5.5 Limitations of the study

The findings of this study should be viewed in light of a few limitations. The use of questionnaires to gather relevant information on the extent of e-procurement adoption alongside the interviews should be noted. The use of additional data collection methods such as observation in order to enhance the richness and depth of future studies.

In addition, access to internal organization documents like board minutes, policies and procedures which could provide more insight into the strategic thinking of the management would greatly have contributed towards a more pragmatic review and analysis. Also most of the senior managers were not available for interview.

REFERENCES

- Aberdeen Group (2001). Best Practices in e-Procurement: The Abridged Report, Aberdeen Group, Boston, MA.
- Abrahamson, E., and Rosenkopf, L. (1993). Institutional and competitive bandwagons: Using Mathematical Modeling as a Tool to Explore Innovation Diffusion. *Academy of Management Review*, 18(3), 487-517.
- Anderson, D.L. and Lee, H.L. (1999). Synchronized supply chains: the new frontier, in Anderson, D. (Ed)
- Archer, N., and Gebauer, J. (2001). Business-to-business applications to support business transactions: Overview and management considerations. In M. Warkentin (Ed.), *Business-to-business electronic commerce*. Hershey, PA: Idea Group Publishing.
- Attaran, M. and Attaran, S. (2002). Catch the wave of e-procurement, *Industrial Management*, Vol. 11 No. 3.
- Bellaaj, M, Bernard, P, Pecquet, P and Plaisent, M (2008). 'Organisational, environmental, and technological factors relating to benefits of website adoption', *International Journal of Global Business*, vol. 1, no. 1, pp. 44-64.
- Bii J.C. (2008). The effect of Business Process Re-engineering on Productivity: A case of Kenya Tea Development Agency. *Unpublished MBA project. University of Nairobi*.
- Burt A, Dobler T.C, Starling L, (2003). World Class Supply Management. The Key to Supply Chain Management. pp 598 Institutional and Government Procurement 7th Ed.
- Cater, N. (2001). E-Procurement in the aid business, *International Trade Forum* Vol 4 pp 27
- Chang, Y. (2004). Design and Implementation of an e-procurement system, *Production Planning & Control*, Vol. 15 No. 7 pp 634-46.
- Chipiro D.D. (2009). The Impact of E-Procurement On Strategic Sourcing. A case of CBZ Bank Limited, Zimbabwe. *Published Master of Leadership Report, University of South Africa*.
- Croom, S.R. (2000). The Impact of Web-based Procurement on the Management of Operating Resources Supply, *Journal of Supply Chain Management*, Vol. 36, No. 1, pp. 4-13.
- Dai, Q. and Kauffmann, R.J (2006). To be or not to B2B: evaluating managerial choices for e-procurement channel adoption, *Information Technology and management*, Vol. 7 No. 2, pp 109-30.
- Davila, A., Gupta, M. and Palmer, R. (2003). Moving procurement systems to the internet: the adoption and use of e-procurement technology models, *European Management Journal*, Vol. 21 No. 1 p 11.

- De Boer, L., Harink, J and Heijboer, G. (2002). A conceptual model for assessing the impact of electronic procurement, *European Journal of Purchasing & Supply Management*, Vol.8 pp 25-33
- DiMaggio, P., and Powell, W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48, 147-160.
- Dooley, K. and Purchase, S. (2006). Factors Influencing e-procurement usage, *Journal of Public Procurement*. Vol 6 pp 28-45.
- Farzin S and Nezhad T. (2010). Electronic Procurement, the Golden Key to Optimizing the Supply Chain System. *World Academy of Science Engineering and Technology* Vol 66 pp 519
- Filiatrault, P. and Huy, L. (2006). *The Adoption of E-commerce in SMEs in Vietnam: A Study of Users and Prospectors*. Retrieved 28 July 2011 from <http://info.hktdc.com/alert/eu0013b.htm>
- Garrido, M, Gutierrez, A. and Jose, R.S. (2008). Organizational and economic consequences of e-procurement intensity, *Technovation*, Vol. 28 No. 9 pp. 615-29.
- Garson, D. (2004). *The Promise of Digital Government*. Hershey, PA: Idea Group Inc
- Gifford, A. (2003). *GoProcure Project Shrinking* www.nzherald.co.nz (Retrieved May 2011)
- Gilmore, A. and Carson, D. (1996). 'Management Competences for Services Marketing', *Journal of services Marketing* pp 39-57
- Heir F.J, Black C.W, Babin B.J, Anderson R.E, 'Multivariate Data Analysis' A Global Perspective. Pearson 7th Ed pp 91-151
- Heizer, J. and Render, B. (2000). *How E-commerce Saves Money*, IIE Solutions pp 22-27
- Huber, B., Sweeny, E. and Smyth, A. (2004). Purchasing consortia and electronic markets- a procurement direction in integrated supply chain management, *Electronic Markets*, Vol. 14 No. 4, pp. 284-94
- Johnson .M.E., and Whang, S.N. (2002). *E-Business and Supply Chain Management an Overview and Framework*, Production and Operations Management pp 11-14.
- Kalakota , R, and Robinson, M. (2001). *E-Business 2.0: Roadmap for Success*. Boston: Addison-Wesley.
- Kashero F. M (2008). Strategic Responses to Changing Environment at Lloyd Masika-Kenya. *Unpublished MBA project. University of Nairobi*
- Kheng, C. B. and Suliman A. (2002). The adoption of Electronic Procurement in Singapore, *Electronic Commerce Research*, Vol.1, pp. 61-73.

- Kiburi F.W (2008). Factors Influencing The Implementation of E-procurement Among Firms Listed in the Nairobi Stock Exchange. *Unpublished MBA project. University of Nairobi.*
- Killen, K.H. and Kamauff, J.W. (1995). Managing Purchasing-Making the Supply Team Work, McGraw-Hill, New York, NY.
- Kotzab E.L (2006). Supply Chain Management Implementation and Priority Strategies in Danish Organizations, *Journal of Business Logistics*, Vol. 27, No. 2, pp. 273-301.
- Kwon, T. H., and Zmud, R. W. (1987). Unifying the fragmented models of information systems implementation. In J. R. Boland & R. A. Hirschheim(Eds.), *Critical issues in information systems research* (pp. 227-251). New York: John Wiley.
- Lee, S., Pank, B. and Lee, H. (2003). Business value of B2B electronic commerce: the critical role of inter-firm collaboration, *Electronic Commerce Research and Applications*, Vol. 2 No. 4, pp. 350-61
- Lennon, C. (2002). Achieving Bottom Line Results in a Flat Economy: Leveraging Procurement Business Services, Computer Sciences Corporation, El Segundo, CA.
- Leonard P. and Cochran J. (2003). B2B e-commerce and E-procurement- a primer Vol 1 pp 49- 50
- Ling, C.Y (2001). *Model of factor influences on electronic commerce adoption and diffusion in small and medium sized enterprises*. ECIS Doctoral Consortium, 24-26 June, AISRegion 2 (Europe, Africa, Middle-East).
- McConnell D.J. (2009). Analysis into the Factors affecting the Uptake of Applications of E-procurement, within the UK public Sector. *A published Doctorial Thesis, Loughborough University.*
- Min, H. and Galle, W.P. (2003). E-purchasing: Profiles of adapters and non-adopters, *Industrial Marketing Management*, pp 227-233
- Minahan, T. and Degan, G. (2001). Best Practices in e-procurement, Boston: Aberdeen Group.
- Mgendi R.M (2010). Expert Systems in Financial services, A survey of the local banks in Kenya. *Unpublished MBA project. University of Nairobi.*
- Moozakis, C. (2001). E-procurement gets priority, *Internet Week*, Vol. 887, pp. 10-12
- Muffato, M. and Payaro, A. (2004). Implementing e-procurement and e-fulfillment processes: A comparison of cases in the Motorcycle Industry. *International Journal of production Economics* Vol 9 pp 339-351
- Ndua, F.G (2009). Port Shipping Strategies *IAPH Journal*. <http://www.iaphworldports.org/>
- Noto, A. (2001). The Future of e-procurement, *Revue Internationale de l'Achat* Vol 1 pp 13-15

- Novack, R.A and Simco, S.W. (1991). The industrial procurement process: a supply chain perspective, *Journal of Business Logistics*, Vol. 12 No. 1, pp. 145-68.
- Osero B. (2009). Mombasa Port Back in Step. *Our Ports Journal*. Vol 2 pp 21.
- Osero B. (2011). Global Perspective of Maritime trends & their Impact on Mombasa. Retrieved on 30/06/2011 from <http://www.kpa.co.ke/InfoCenter/News/Pages/Bil.aspx>
- Panayiotou, N.A., Gayialis, S.P. and Tsatsiopoulos, I.P. (2004). An E-procurement System for governmental purchasing, *International Journal of Production Economics*, Vol. 90, pp 79-102.
- Patterson, K., Grimm, C. and Corsi, T. (2003). Adopting new technologies for supply chain management. *Transportation Research* 3: 95 – 121
- Peck, Nerton and Frederick S, Frederic G. (1962). The Weapons Acquisition process: an economic analysis. Boston Harvard Business School.
- Pires, G. and Stanton, J. (2005). A research framework for the electronic procurement adoption process: drawing from Australian evidence, *Journal of Global Business and Technology* Vol 1 pp 12-20
- Porter, M.E. (1980). *Competitive Strategy*, The free Press, New York, NY.
- Premkumar, G & Roberts, M (1999). 'Adoption of new information technologies in rural small businesses', *The International Journal of Management Science*, vol. 27, pp. 467-484.
- Presutti, Jr W.D. (2003). Supply Management and E-procurement: Creating Value added in e-supply chain, *Industrial Marketing Management* Vol. 3 pp 219-226
- Puschmann, T. and Alt, R, (2005). Successful use of e-procurement in supply chains, *Supply Chain Management: An International Journal*, Vol. 10 No. 2, pp 122-33
- Rogers, E. M. (1995). *Diffusion of innovation*. New York: The Free Press.
- Saeed, K.A. and Leith, R.A. (2003). Controlling sourcing risk in electronic marketplaces, *Electronic Markets*, Vol. 13 No.2, pp 163-72
- Sanders, Nada R. (2007). The Benefits of Using E-Business Technology: The Supplier Perspective, *Journal of Business Logistics*, Vol. 28, No. 2, pp 177-207.
- Saunders, M., Lewis, P. and Thornhill, A. (2003). *Research Methods for Business Students*. Delhi India. Pearson Education.
- Schoenherr, T. and Tummalla V. (2007). Electronic Procurement: A Structured Literature Review and Direction for Future Research. *International Journal of Procurement Management*. Vol 1 pp 2-5
- Segev; Gabauer and Faeber, (2000). Electronic Market Places. *European Journal of Operational Research* Vol. 2 pp 104-111

- Steinberg R. (2003). Strategies for successful Government E-procurement. *Electronic Procurement Journal* pp 47.
- Tassabehji, R. and Moorhouse, A. (2008). The changing role of procurement: developing professional effectiveness, *Journal of Purchasing & Supply Management*, Vol. 14 No. 1 pp 55-68
- Tavi, J. (2008). Learning from Global World-Class e-procurement Practices. *Journal of strategic finance* pp. 25-29
- Teo, T.S.H and Tan, M. (1998). 'An empirical study of adopters and non-adopters of the Internet in Singapore', *Information & Management*, vol. 34, pp. 339-345.
- Thong, J.Y.L (1999). 'An integrated model of information systems adoption in small businesses', *Journal of Management Information Systems*, vol. 15, no. 4, pp. 187-214.
- Thong, J.Y.L and Yap, C.S (1995). 'CEO characteristics, organizational characteristics and information technology adoption in small businesses', *Omega, International Journal of Management Science* vol. 23, no. 4, pp. 429-442.
- Turban, E., King, D., Lee, J. and Viehland, D. (2006). Electronic Commerce 2006: A Managerial Perspective, *Pearson/Prentice-Hall, Englewood Cliffs, NJ*.
- Vikiru K. Stephen (2008). Credit Management Practices at The Kenya Power & Lighting Co Ltd *Unpublished MBA project. University of Nairobi*.
- World Bank, (2003). Electronic Government Procurement (E-Gp)' *World Bank Draft Strategy*, Washington.
- Wu, F., Zsidisin, G.A., & Ross, A.D. (2007). Antecedents and Outcomes of e-procurement adoption: an integrative model, *IEEE Transactions on Engineering Management*, pp 576-587.
- Wyld, D.C. (2004). The Weather Report for the Supply Chain: A Longitudinal Analysis of the ISM/Forrester Research Reports on Technology in Supply Management, 2001- 2003, *Management Research News*, Vol. 27, No. 1, pp. 1-26.
- Yen, B.P.C. and Ng, E.O.S (2002). Migrating procurement onto the internet, *Electronic Commerce Research*, Vol. 2, pp 113-34.
- Yin, R. (2003). *Case Study Research: Design and Methods*, Applied Social Research 3rd ed. Sage Publication Inc

APPENDICES

APPENDIX I: INTRODUCTORY LETTER



**UNIVERSITY OF NAIROBI
COLLEGE OF HUMANITIES AND SOCIAL SCIENCES
SCHOOL OF BUSINESS
DEPARTMENT OF MANAGEMENT SCIENCE**

Telephone: 4184160/1-5 Ext. 220
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P.O. Box 30197
Nairobi, Kenya

Introductory Letter

August 2011

Dear Respondent,

I am a postgraduate student at the School of Business, University of Nairobi, currently carrying out a research titled **"Electronic Procurement Adoption: The case of Kenya Ports Authority"**. This is in partial fulfillment to the award of Masters Degree in Business Administration (Information Systems).

You have been selected as one of the respondents in this study. I therefore request you to kindly facilitate the collection of the required data by answering the questions herein.

This questionnaire is purely for academic purpose and the data collected will be treated with utmost confidentiality. A copy of the completed project shall be availed to you upon request.

Your assistance and cooperation will be highly appreciated. Thank you in advance.

Yours Faithfully,


Eric Katana Lewa
Student
[0725513330](tel:0725513330) / [0735513333](tel:0735513333)


Odock Stephen
Lecturer, Department of Management Science



APPENDIX II: QUESTIONNAIRE

Please spare a little of your time to fill in this questionnaire. Your answers will remain anonymous and in no incidence will your name be mentioned in this report.

Section A: (Demographic details)

Please provide some background information (tick where applicable)

1. Age group

a) 21-25 []

b) 26-30 []

c) 31-35 []

d) 36-40 []

e) 41-45 []

f) 46-50 []

g) Above 51 []

2. What level of education have you completed?

a) Primary School []

b) O level/ Form Four []

c) A level or Equivalent []

d) Diploma/ HND []

e) Degree []

f) Postgraduate/PhD []

3. Current work position (level)

a) Head of Division []

b) Head of Department []

c) Principal Officer []

- d) Section Head ☐ ☐
- e) Supervisor ☐ ☐
- f) Docker/Messenger ☐ ☐
- g) Other (please specify)

4. For how long have you worked at KPA?

- a) Less than one year ☐ ☐
- b) 1-5 years ☐ ☐
- c) 6-10 years ☐ ☐
- d) 11-15 years ☐ ☐
- e) 16-20 years ☐ ☐
- f) Over 20 years ☐ ☐

5. For how long have you worked in your current position?

- a) Less than one year ☐ ☐
- b) 1-5 years ☐ ☐
- c) 6-10 years ☐ ☐
- d) 11-15 years ☐ ☐
- e) 16-20 years ☐ ☐
- f) Over 20 years ☐ ☐

Section B

6. To what extent did the following factors influence adoption of e-procurement at Kenya Ports Authority? Rate these factors on a scale of 1-5 (1-least important, 2-less important, 3-neutral, 4-important, 5-most important). Tick where applicable.

Factors that influenced e-procurement adoption at KPA	Least Important	Less important	Neutral	Important
KPA wanted equal opportunity to all suppliers				
KPA had a problem in handling the large number of suppliers				
KPA wanted to get value for money on its procurement processes				
Supplier preference for organization utilizing e-procurement				
KPA wanted to eliminate the long queues experienced at the offices				
The level of corruption was high				
The type of business activities, operations and processes				
Response to stiff market competition				
Donor funding to implement the e-procurement project				
The need to match international business market trends				
KPA wanted to reduce the large number of procurement staff that were involved				
In order to reduce paper work and associated costs				
The manual procurement process was slow and tedious				
Government policies (Benchmark standards)				
External pressures from stakeholders				
Perceived competitive advantage and associated benefits				
Compatibility with other internal processes				
Big organizational size				

With these factors on their benefit to KPA? Rate these benefits on a scale of 1-5 (1-least important, 2-less important, 3-neutral, 4-important, 5-most important).

Benefits of e-procurement adoption at KPA	Least Important	Less important	Indifferent (Neutral)	Important	Most Important
Reduced transaction costs					
Better accuracy					
Enhanced transactional speed					
Low inventory levels					
Improved financial results					
Improved communication between buyers and suppliers					
Reduce administrative hours, freeing staff to do other work					
Enhanced information sharing and integration					
Reduced paper work and associated costs					
Reduced corruption and corrupt practices					
Workflow automation					
Improved contract compliance					
Improve buyer/supplier relationships					
Enhance corporate image					
The adoption is contributing to the enablement of e-government					
Improve financial control by making it easier to match orders					
Ease of reference for online transactions					

High degree of transparency on procurement transactions					
Improved process monitoring					
Ease of process auditing					
Shorten the delivery time by eliminating the need to wait for paper documents by hand					
Shorter procurement cycles					
Greater savings from group purchasing discounts					
Maximize labor by empowering the employees to make transactions that are correct for their work					
Ensure deliveries on time, every time					
Increased communication and collaboration between suppliers and buyers					
Better integration with other back office organizational operations					
Enhanced supplier selection					

8) The following are some of the challenges relating to e-procurement adoption. This question asks for your level of agreement with the challenges presented. Rate them on a scale of 1-5 where, 1 represents Strongly Agree; 2 Agree; 3 Indifferent (Neutral); 4 Disagree; 5 strongly disagree.

Are the following challenges experienced with e-procurement adoption at KPA?	Strongly Agree	Agree	Indifferent (Neutral)	Disagree	Strongly disagree
Internal end user resistance to learn new technology					
Lack of adequate technological infrastructure for KPA					
Lack of adequate technological infrastructure for external users					
Suppliers sharing passwords					
Persistent temporary unavailability of the system					
Feeling insecure when transacting online					
Suppliers are not interested in new technology					
Data exchange standards lacking					
E-procurement does not integrate well with other internal systems (e.g. SAP)					
Rigid company culture which does not support new technologies					
Lack of upper management support					
Lack of skilled procurement personnel					
High implementation costs					
High staff training costs					
Expensive e-procurement systems					
Lack of robust business relationships with suppliers					
No real business benefit identified					
Insufficient internal resources to support e-procurement (funds)					
Lack of government incentives in new					

technology adoption					
Lack of legal framework, rules and regulations					
Any other challenges?					

APPENDIX III: INTERVIEW GUIDE

This interview guide has been designed to collect information from selected key procurement personnel of the Kenya Ports Authority. Please feel free to participate in the discussion.

A. Demographic details

- 1) For how long have you worked for KPA?

B. Interview questions

- 2) i. When was e-procurement adoption conceived by KPA?

ii. Was the process of e-procurement adoption well implemented? Give reasons for your answer.

- iii. Did you encounter any resistance during the implementation and consequent adoption of e-procurement at KPA? What kind of resistance was experienced?

- 3) i. What preparations did you make prior to e-procurement adoption? (The preparation in terms of policies and procedures, communication to employees, training, e-procurement software, etc.)

ii. What specific actions did KPA take as an organization to empower employees to participate effectively in e-procurement adoption?

- 4) i. What are the e-procurement practices that KPA has already implemented?

ii. What are the factors that influenced adoption of these e-procurement practices at KPA?

- 5) In what ways do you think the adoption of e-procurement has benefited KPA?

- 6) i. What are the challenges that KPA is experiencing in e-procurement adoption?

ii. What is the organization doing in tackling the challenges/obstacles mentioned above?

Thank you for your cooperation.

STATISTICAL TABLES

Appendix IV: Factors that have influenced e-procurement adoption at KPA.

Appendix IV(a) Rotated component matrix

Rotated Component Matrix ^a							
	Component						
	1	2	3	4	5	6	7
WANTED EQUAL OPPORTUNITY TO ALL SUPPLIERS	.116	.176	.766	.205	-.530	-.022	.212
PROBLEM IN HANDLING LARGE SUPPLIERS	.348	-.085	.208	-.050	-.195	.856	-.045
VALUE FOR MONEY ON PROCUREMENT PROCESS	-.139	-.173	.190	.909	-.069	-.264	-.109
SUPPLIER PREFERENCE	.903	.275	-.046	.032	.173	.263	.073
ELIMINATE QUEUES	.101	-.413	.188	.788	-.172	.332	-.128
CORRUPTION WAS HIGH	.820	-.304	-.010	-.229	.261	-.076	-.295
TYPE OF ACTIVITIES AND THE PROCESSES	.250	.081	-.115	-.144	.842	.017	.277
STIFF COMPETITION	.687	.214	-.153	.459	.108	.411	-.201
MATCH INTERNATIONAL BUSINESS TREND	.346	.355	-.176	.289	.305	.557	.100
REDUCE PROCUREMENT STAFF	.538	.327	.077	.403	.438	.396	-.259
REDUCE PAPERWORK	.280	-.225	.871	.280	-.092	.085	-.096
DONOR FUNDING	.795	.444	.050	-.130	.275	.263	-.024
MANUAL PROCESS WAS SLOW	-.049	-.090	.925	.192	.231	.094	.029
GOVERNMENT POLICIES(BENCH MARK)	.690	.346	-.281	-.140	.207	-.495	-.061
EXTERNAL PRESSURE FROM EXTERNAL STAKEHOLDERS	.247	-.352	-.891	-.006	.085	.037	-.030
COMPETITIVE ADVANTAGE	.085	.972	.103	-.025	-.074	.086	-.124
COMPATIBILITY WITH OTHER PROCESSES	.066	.488	-.416	-.152	.667	-.270	-.082
BIG ORGANIZATIONAL SIZE	.948	.032	.087	-.128	-.048	.114	.017

SUCCESSFUL ADOPTION OF OTHER I.T SOLUTIONS	.042	.876	-.035	-.128	.430	.013	-.020
LEVEL OF EDUCATION(EMPLOYEES)	.947	.144	.053	-.064	-.177	.079	.109
UTILISE AVAILABLE FUNDS	.145	.366	-.699	.165	.214	-.104	.476
PERCEIVED SAVINGS	.570	.199	.289	.276	.180	.509	.424
COMPANY CULTURE TO UPGRADE INNOVATION	-.223	.197	-.073	-.347	.104	-.017	.867
LEGAL ISSUES	.342	.828	-.155	-.283	.050	-.277	.047
EASE FUTURE REFERENCE	.457	.779	-.018	.211	-.291	-.054	.145
QUICK AND TIMELY DECISION MAKING	-.227	.019	.243	.868	-.127	.187	-.205
STREAMLINE SUPPLY CHAIN	.184	.334	.711	.238	-.336	.219	-.281
MANAGEMENT ATTITUDE	-.064	-.593	-.376	.218	-.388	-.417	-.111
ECONOMIC GROWTH	.131	.765	.162	-.004	.201	.327	.420
OTHERS	.142	-.301	-.110	-.575	.025	.051	.728

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 16 iterations.

Appendix IV(b) Total Variance Explained

Total Variance Explained							
		Initial Eigenvalues ^a			Extraction Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	7.439	21.535	21.535	7.439	21.535	21.535
	2	4.717	13.655	35.190	4.717	13.655	35.190
	3	3.192	9.242	44.432	3.192	9.242	44.432
	4	2.945	8.576	52.958	2.945	8.576	52.958
	5	2.536	7.341	60.299	2.536	7.341	60.299
	6	1.639	4.744	65.043	1.639	4.744	65.043
	7	1.418	4.106	69.149	1.418	4.106	69.149
	8	1.348	3.903	73.052	1.348	3.903	73.052
	9	.967	2.798	75.850			
	10	.941	2.723	78.573			
	11	.873	2.528	81.101			
	12	.808	2.340	83.441			
	13	.754	2.182	85.623			
	14	.681	1.972	87.595			

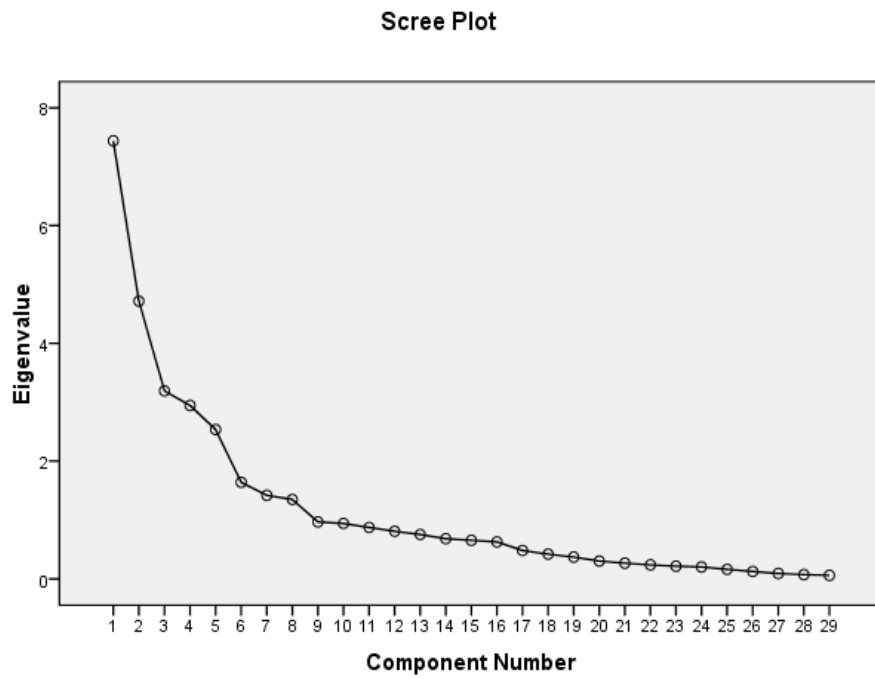
	1	.654	1.894	89.489			
	5						
	1	.628	1.818	91.307			
	6						
	1	.481	1.393	92.700			
	7						
	1	.419	1.214	93.914			
	8						
	1	.370	1.070	94.984			
	9						
	2	.302	.875	95.858			
	0						
	2	.267	.772	96.631			
	1						
	2	.238	.688	97.319			
	2						
	2	.215	.621	97.940			
	3						
	2	.202	.584	98.524			
	4						
	2	.162	.468	98.992			
	5						
	2	.125	.363	99.355			
	6						
	2	.091	.264	99.619			
	7						
	2	.072	.209	99.827			
	8						
	2	.060	.173	100.000			
	9						
Rescaled	1	7.439	21.535	21.535	5.681	19.588	19.588
	2	4.717	13.655	35.190	3.880	13.381	32.969
	3	3.192	9.242	44.432	2.603	8.978	41.946
	4	2.945	8.526	52.958	2.350	8.102	50.048
	5	2.536	7.341	60.299	2.320	8.000	58.049
	6	1.639	4.744	65.043	1.301	4.487	62.535
	7	1.418	4.106	69.149	1.256	4.331	66.867
	8	1.348	3.903	73.052	1.206	4.160	71.027
	9	.967	2.798	75.850			
	1	.941	2.723	78.573			
	0						
	1	.873	2.528	81.101			
	1						
	1	.808	2.340	83.441			
	2						
	1	.754	2.182	85.623			
	3						
	1	.681	1.972	87.595			
	4						
	1	.654	1.894	89.489			
	5						
	1	.628	1.818	91.307			
	6						
	1	.481	1.393	92.700			
	7						
	1	.419	1.214	93.914			
	8						
	1	.370	1.070	94.984			
	9						
	2	.302	.875	95.858			
	0						
	2	.267	.772	96.631			
	1						
	2	.238	.688	97.319			
	2						

2	.215	.621	97.940		
3					
2	.202	.584	98.524		
4					
2	.162	.468	98.992		
5					
2	.125	.363	99.355		
6					
2	.091	.264	99.619		
7					
2	.072	.209	99.827		
8					
2	.060	.173	100.000		
9					

Extraction Method: Principal Component Analysis.

a. When analyzing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution.

Appendix IV (c) Scree Plot



Appendix IV (d) KMO and Bartlett's Test

KMO and Bartlett's Test^a

Bartlett's Test of Sphericity	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.581
	Approx. Chi-Square	999.566
	df	406
	Sig.	.000

a. Based on correlations

Appendix V: Benefits of e-procurement adoption at KPA

Appendix V (a) Rotated Component Matrix

Rotated Component Matrix ^a							
	Component						
	1	2	3	4	5	6	7
REDUCED TRANSACTION COST	.396	.123	.173	.701	-.110	.001	.064
BETTER ACCURACY	.052	-.174	.202	.758	.098	.159	.258
ENHANCE SPEED	.237	.065	.541	.550	.195	.269	-.120
LOW INVENTORY LEVELS	.184	-.142	.078	.112	-.116	.855	-.008
IMPROVED FINANCE RESULTS	.372	.420	.078	.460	.014	.519	.044
IMPROVED COMMUNICATION BTWN BUYERS AND SUPPLIERS	-.058	.776	-.039	.194	-.176	-.005	.397
FREEING STAFF	.429	.115	-.134	.467	-.368	.059	.268
ENHANCE INFORMATION SHARING	.600	.422	.281	.093	.073	-.125	-.020
REDUCE PAPER WORK	.872	.075	.053	.131	-.138	.142	.072
REDUCE CORRUPTION AND CORRUPT PRACTICES	.794	.172	.080	.240	.101	.006	.032
WORK FLOW AUTOMATION	.015	-.044	.140	-.120	.829	-.054	.033
IMPROVED CONTRACT COMPLIANCE	.185	-.047	.144	.223	.795	.244	-.053
IMPROVE BUYER SUPPLIER RELATIONSHIP	.255	.782	-.162	.124	.116	.145	.062
ENHANCE CORPORATE IMAGE	-.027	.306	-.038	-.084	.673	-.328	.131
ADOPT E-GOVERNMENT	.152	.800	.027	-.034	.021	-.229	-.093
IMPROVE FINANCE CONTROL	.206	.772	.364	-.087	-.005	-.110	.186
EASE OF REFERENCE	.511	.384	.534	.028	.000	.208	.171
TRANSPARENCY OF PROCUREMENT	.646	.472	.205	.337	.041	-.115	-.061
IMPROVED MONITORING	.206	.009	.783	.195	.300	-.032	.213
EASE OF PROCESS AUDIT	.135	.069	.900	.141	.050	.106	.070
SHORTEN DELIVERY TIME	.506	.285	.141	.229	.351	.412	.184
SHORTER PROCUREMENT CYCLE	.665	-.098	.189	.200	.255	.294	.208
GREATER SAVINGS FROM GROUP PURCHASE DISCOUNTS	-.030	.685	.205	-.242	.127	.375	.200
MAXIMISE LABOUR	.612	.097	.208	.155	.128	.347	.501
ENSURE ON TIME DELIVERY	.668	.025	.079	-.157	.138	.292	.308
INCREASE COMMUNICATION BTWN SUPPLIERS AND BUYERS	.156	.444	-.004	.141	.204	-.159	.694
INTERGRATION WITH BACK OFFICE	.269	.131	.294	.176	-.076	.102	.748
ENHANCE SUPPLIER SELECTION	.458	.063	.291	.351	-.089	-.023	.076

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

Appendix V (b) Total Variance Explained

Total Variance Explained						
Component	Initial Eigenvalues ^a			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw 1	8.589	32.878	32.878	8.589	32.878	32.878
2	3.629	13.891	46.769	3.629	13.891	46.769

Total Variance Explained

	Component	Initial Eigenvalues ^a			Extraction Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw	1	8.589	32.878	32.878	8.589	32.878	32.878
	2	3.629	13.891	46.769	3.629	13.891	46.769
	3	2.728	10.444	57.213	2.728	10.444	57.213
	4	1.459	5.586	62.799	1.459	5.586	62.799
	5	1.325	5.073	67.872	1.325	5.073	67.872
	6	1.224	4.686	72.557	1.224	4.686	72.557
	7	1.116	4.272	76.829	1.116	4.272	76.829
	8	.720	2.755	79.584			
	9	.665	2.547	82.131			
	10	.583	2.233	84.363			
	11	.543	2.078	86.441			
	12	.493	1.887	88.328			
	13	.437	1.673	90.000			
	14	.414	1.585	91.585			
	15	.350	1.340	92.925			
	16	.341	1.306	94.231			
	17	.287	1.097	95.328			
	18	.252	.964	96.292			
	19	.212	.810	97.102			
	20	.148	.565	97.667			
	21	.130	.498	98.165			
	22	.108	.414	98.579			
	23	.101	.385	98.964			
	24	.083	.320	99.284			
	25	.074	.285	99.569			
	26	.049	.189	99.757			
	27	.035	.133	99.890			
	28	.029	.110	100.000			
Rescaled	1	8.589	32.878	32.878	9.273	33.119	33.119
	2	3.629	13.891	46.769	3.426	12.237	45.356
	3	2.728	10.444	57.213	2.488	8.885	54.241
	4	1.459	5.586	62.799	1.436	5.129	59.370
	5	1.325	5.073	67.872	1.386	4.950	64.320
	6	1.224	4.686	72.557	1.324	4.728	69.048
	7	1.116	4.272	76.829	1.415	5.055	74.103
	8	.720	2.755	79.584			
	9	.665	2.547	82.131			
	10	.583	2.233	84.363			
	11	.543	2.078	86.441			
	12	.493	1.887	88.328			
	13	.437	1.673	90.000			
	14	.414	1.585	91.585			
	15	.350	1.340	92.925			
	16	.341	1.306	94.231			
	17	.287	1.097	95.328			
	18	.252	.964	96.292			
	19	.212	.810	97.102			
	20	.148	.565	97.667			
	21	.130	.498	98.165			
	22	.108	.414	98.579			
	23	.101	.385	98.964			
	24	.083	.320	99.284			
	25	.074	.285	99.569			
	26	.049	.189	99.757			
	27	.035	.133	99.890			
	28	.029	.110	100.000			

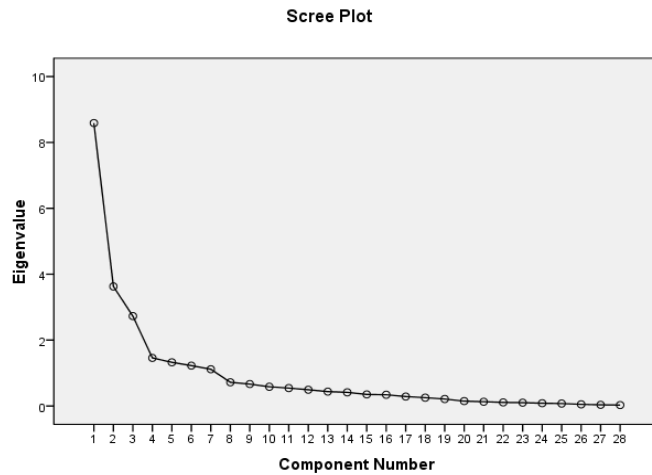
Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Total	Initial Eigenvalues ^a			Extraction Sums of Squared Loadings		
		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Raw 1	8.589	32.878	32.878	8.589	32.878	32.878	32.878
2	3.629	13.891	46.769	3.629	13.891	46.769	46.769

a. When analyzing a covariance matrix, the initial eigenvalues are the same across the raw and rescaled solution.

Appendix V (c) Scree Plot



Component Matrix^a

	Raw						
	Component						
	1	2	3	4	5	6	7
MAXIMISE LABOUR	.814	.324	.031	-.264	-.005	-.218	.079
TRANSPARENCY OF PROCUREMENT	.743	-.056	-.099	.377	-.158	.126	.036
EASE OF REFERENCE	.571	.022	.014	-.022	-.026	.117	.172
SHORTEN DELIVERY TIME	.750	.208	.169	-.115	.016	.074	-.208
IMPROVED FINANCE RESULTS	.701	.121	-.154	-.081	.093	.354	-.309
REDUCE CORRUPTION AND CORRUPT PRACTICES	.731	.258	-.090	.316	-.274	-.128	-.038
ENHANCE INFORMATION SHARING	.563	-.050	.009	.232	-.154	-.005	.110
REDUCE PAPER WORK	.587	.293	-.235	.115	-.283	-.078	-.014
IMPROVE FINANCE CONTROL	.754	-.664	.077	.017	-.063	.051	.339
SHOTER PROCUREMENT CYCLE	.593	.477	.084	-.001	-.010	-.005	-.034
ENSURE ON TIME DELIVERY	.738	.349	.101	-.358	-.514	-.472	.091
IMPROVE BUYER SUPPLIER RELATIONSHIP	.581	-.398	-.041	-.011	-.055	.059	-.394
INTERGRATION WITH BACK OFFICE	.546	.069	-.108	-.161	.391	-.241	.196
INCREASE COMMUNICATION BTWN SUPPLIERS AND BUYERS	.635	-.339	.077	.000	.435	-.521	-.066

REDUCED TRANSACTION COST	.392	.169	-.189	.181	.110	.132	.031
ENHANCE SPEED	.365	.246	.074	.084	.087	.273	.149
IMPROVED MONITORING	.379	.162	.259	.073	.213	.099	.347
ENHANCE SUPPLIER SELECTION	.428	.201	-.158	.171	.117	.123	.168
ADOPT E-GOVERNMENT	.544	-.829	.024	.314	-.310	.132	-.019
IMPROVED COMMUNICATION BTWN BUYERS AND SUPPLIERS	.551	-.682	-.281	-.128	.322	-.030	-.106
BETTER ACCURACY	.255	.319	-.053	.023	.296	.030	.058
WORK FLOW AUTOMATION	.128	.103	.965	.172	.077	-.106	-.129
IMPROVED CONTRACT COMPLIANCE	.373	.392	.737	.106	.127	.190	-.309
FREEING STAFF	.554	.218	-.739	.149	.226	-.076	-.291
ENHANCE CORPORATE IMAGE	.142	-.256	.457	.242	.132	-.181	-.156
GREATER SAVINGS FROM GROUP PURCHASE DISCOUNTS	.612	-.606	.287	-.643	-.092	.263	.000
LOW INVENTOY LEVELS	.209	.406	-.128	-.426	-.039	.293	-.122
EASE OF PROCESS AUDIT	.336	.135	.126	.015	.178	.241	.426

Extraction Method: Principal Component Analysis.

a. 7 components extracted.

Appendix V (d) KMO and Bartlett's Test

KMO and Bartlett's Test ^a		
Bartlett's Test of Sphericity	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.724
	Approx. Chi-Square	1298.648
	df	378
	Sig.	.000

a. Based on correlations

Appendix VI: Challenges of e-procurement adoption at KPA

Appendix VI (a) Rotated Component Matrix

	Rotated Component Matrix ^a				
	Component				
	1	2	3	4	5
INTERNAL AND USER RESISTANCE	.122	-.196	.505	.117	.541
LACK OF I.T INFRASTRUCTURE	.147	-.170	.642	.164	.136
LACK OF ADEQUATE TECHNICAL INFRASTRUCTURE	-.031	.425	.095	-.048	.654
SUPPLIER SHARING PASSWORDS	-.254	.835	.079	-.070	.196
PERSISTENT TEMPORARY UNAVAILABILITY OF SYSTEM	.009	.812	.073	.136	.030
FEELING UNSECURE WHEN TRANSACTING ONLINE	.299	.776	-.043	.078	.122
SUPPLIERS NOT INTERESTED IN TECHNOLOGY	-.071	.612	-.111	.065	.536
LACK OF DATA EXCHANGE STANDARDS	.175	.043	.095	.294	.725
E-PROCUREMENT DOES NOT INTERGRATE WELL WITH OTHER SYSTEMS	-.101	-.026	.660	.247	.159
RIGID COMPANY CULTURE	.293	.188	.662	-.105	.091
LACK OF UPPER MANAGEMENT SUPPORT	.556	.191	.601	.000	-.134
LACK OF SKILLED PROCUREMENT SUPPORT	.357	.260	.638	.181	-.029
HIGH IMPLEMENTATION COST	.768	-.069	.291	.087	.121
HIGH STAFF TRAINING COST	.847	-.006	.237	.058	.064
EXPENSIVE PROCUREMENT SYSTEM	.761	.127	.160	.069	.095
LACK OF ROBUST BUSINESS RELATIONSHIPS WITH SUPPLIERS	.223	.290	.148	-.074	.596
NO BUSINESS BENEFITS IDENTIFIED	.738	-.193	-.140	.337	.188
INSUFFICIENT INTERNAL RESOURCES	.192	-.055	.413	.557	.211
LACK OF GOVERNMENT INCENTIVES ON NEW TECHNOLOGY	.197	.188	.185	.820	.051
LACK OF LEGAL FRAMEWORK	.044	.037	.059	.866	.017

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

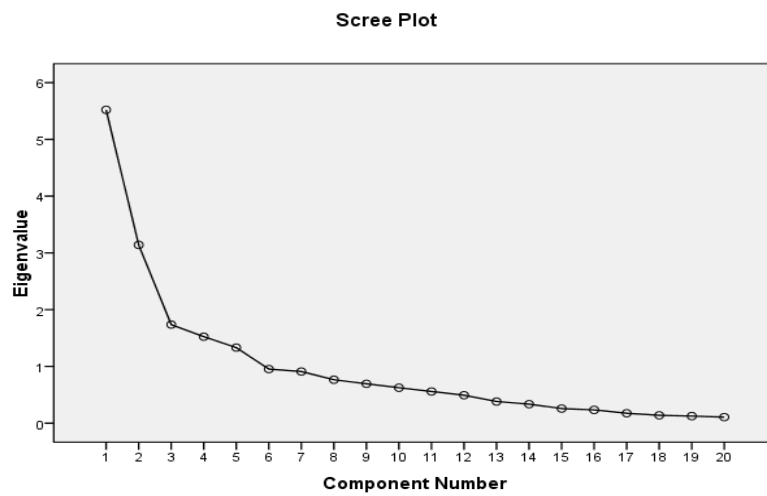
Appendix VI (b) Component Matrix

Component Matrix ^a					
	Component				
	1	2	3	4	5
HIGH STAFF TRAINING COST	.692	-.338	-.399	.163	.054
LACK OF SKILLED PROCUREMENT SUPPORT	.692	-.043	-.059	-.241	-.305
HIGH IMPLIMENTATION COST	.687	-.352	-.294	.099	.097
LACK OF UPPER MANAGEMENT SUPPORT	.674	-.190	-.317	-.233	-.283
EXPENSIVE PROCUREMENT SYSTEM	.646	-.173	-.379	.206	.034
INSUFFICIENT INTERNAL RESOURCES	.604	-.155	.414	.026	-.059
RIGID COMPANY CULTURE	.588	-.013	-.175	-.439	-.101
LACK OF GOVERNMENT INCETIVES ON NEW TECHNOLOGY	.581	.000	.463	.362	-.315
INTERNAL AND USER RESISTANCE	.536	-.103	.273	-.317	.377
LACK OF DATA EXCHANGE STANDARDS	.534	.194	.291	.124	.482
LACK OF I.T INFRASTRUCTURE	.506	-.263	.204	-.375	-.012
LACK OF ROBUST BUSINESS RELATIONSHIPS WITH SUPPLIERS	.479	.359	-.089	-.060	.382
E-PROCUREMENT DOES NOT INTERGRATE WELL WITH OTHER SYSTEMS	.439	-.053	.378	-.427	-.103
SUPPLIER SHARING PASSWORDS	.149	.856	-.060	-.124	-.191
SUPPLIERS NOT INTRESTED IN TECHNOLOGY	.268	.744	.044	.130	.198
PERSISTENT TEMPORARY UNAVAILAIBILITY OF SYSTEM	.316	.662	-.101	.088	-.358
LACK OF ADEQUATE TECHNICAL INFRASTRUCTURE	.359	.594	.049	-.091	.359
FEELING UNSECURE WHEN TRANSACTING ONLINE	.433	.582	-.296	.250	-.197
LACK OF LEGAL FRAMEWORK	.384	-.067	.597	.413	-.280
NO BUSINESS BENEFITS IDENTIFIED	.512	-.375	-.112	.533	.225

Extraction Method: Principal Component Analysis.

a. 5 components extracted.

Appendix VI (c) Scree Plot



Appendix VI (d) KMO and Bartlett's Test

KMO and Bartlett's Test		
Bartlett's Test of Sphericity	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.695
	Approx. Chi-Square	629.501
	df	190
	Sig.	.000

