E-PROCUREMENT MANAGEMENT ON IMPROVEMENT OF PUBLIC PROCUREMENT PROCEDURES

A CASE STUDY OF NORTHERN PROVINCE IN RWANDA

By

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DECLARATION

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APPROVAL

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DEDICATION

This research thesis is dedicated to my family for their devotion and support towards my academic accomplishment.

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Second, I thank my parents who gave me the love and enabled our to work hard and directed in all, as well as taking care of our during my studies

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TUYISENGE Vincent

ABSTRACT

This research was aiming generally to analyse the effect of E-Procurement system on performance of Public procurement procedures in Districts of Northern Province of Rwanda. The study's specific objectives included analyzing the effectiveness of E-bidding within a reference case of Districts of Northern Province of Rwanda , determining the contribution of e-evaluation on performance of Public procurement procedures in Districts of Northern Province of Rwanda, assessing the contribution of E-contract on performance of Public procurement procedures in Districts of Northern Province of Rwanda and comparing the performance of procurement procedures and manual procurement after introduction of e-procurement in Districts in Northern Province of Rwanda . This study was carried out in 5 Districts of Northern Province in Rwanda. This study considered the agency theory that is having relation with e-procurement system, the neoclassic theory and the regulatory theory which are related to public procurement performance. In respect of this study, target population was 142 employees of five District of Northern Province in Rwanda who dealing day to day with procurement procedures. The sample of respondents was one hundred and five (105) composed by Procurement officers, members of tender committee and Internal Auditors of five Districts and five District Hospitals, Legal Advisors, Director of Finance, Corporate Service Division Managers and Executive Secretaries of five districts of Districts in Northern Province of Rwanda. Findings on "Contribution of e-contract on performance of public procurement procedures in Districts in Northern Province of Rwanda", The researcher found that at different levels there is a contribution of e-contract on performance of public procurement procedures in Districts in Northern Province of Rwanda. The respondents disagreed that by e-contract the suppliers are delivering the right thing at the right time. In order to test our hypothesis (df)=104, p-value =1.985 (critical two tails was used) the significant level is between 0.05 above ($p \geq \bar{\alpha}$), this implies that there is statistically significant difference between meansof two sample @ 0.001Comparison on level of openness and transparency of public procurement cycle. Based on research findings there are strong evidences to conclude that e-procurement contributed positively on the improvement of public procedures in Rwanda.

Key words: ***E-Procurement system, E-contract, e-evaluation, E-bidding, performance of public procurement***

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THE LIST OF ABBREVIATIONS AND ACCRONYMS

B2B	: Business to Business
DS	: Dishonest Supplier
ECTA	: Electronic Communications and Transactions Act
EDI	: Electronic Data Interchange
eINV	: Electronic Invoicing
EPQ	: User Perceived e-Procurement Quality
ERP	: Enterprise Resource Planning
ICT	: Information and Communication Technology
IT	: Information Technology
JIT	: Just in Time
MINECOFIN	: Ministry of Finance and Economic Planning
NP	: Districts in Northern Province
PO	: Procurement Officer
SPSS	: Statistical Package for the Social Sciences
ULK	: Université Libre de Kigali
US	: United State
WWW	: World Wide Website

CHAPTER 1 : GENERAL INTRODUCTION

Introduction

E-procurement can be used to describe various forms of communication technology at different stages of procurement. This may include need identification, specification, search, sourcing, negotiation, order placement, receipt registration, payment, and post-supply evaluation. In this study, Researcher was particularly interested in the inter-organizational systems that automate the ordering process and link end-users to the electronic catalogs of preferred suppliers.

1.1. Background of the study

Governments around the world are constantly buying goods and services from the private sector, from small everyday expenses to large infrastructure projects. Keeping the procurement process simple and cost-efficient is a major challenge that every government faces. However, the best efforts, the public procurement process is often lengthy, complex, and costly. To address the problem, many governments around the world have implemented digitized processes to make procurement easier, faster, and more transparent, and to reduce the likelihood of corruption. (Croom & Brandon-Jones, 2007**)** Among The reasons why government use public procurement is to enhance competition, transparency and value for money. The government of Rwanda uses public procurement for satisfying its needs.

According to World bank report (2016) E-procurement systems have several advantages and disadvantage compared to traditional paper-based procurement procedures.

First, an e-procurement system creates a single online portal for stakeholders to access information on procurement opportunities e-procurement facilitates quick and easy decision-making, Government officials can easily see detailed information on bids through

the online system, rather than having to sift through paperwork and disadvantage of e-procurement might be incentive of the vendor to take advantage of the customer because the vendor is obtaining more information about the customer than in case of normal supply chain management structure (Hen and Paulraj, 2004).

According to Mawenya (2008), there exist considerable inefficiencies in the procurement processes in the public sector which to a greater extent affect the achievement of value for money in the procurement of public infrastructure as a result of corruption. Vee and Skitmore (2003) outlined some areas prevalent with corruption to be proprietary information infringements, collusive bidding during, cash inducements (bribery) for overvaluing work performed, negligence in the form of poor-quality documents and fraudulent conduct by the parties involved procurement process. These challenges have led to the introduction of the new e-Procurement process which ensures that all processes are carried out electronically and thus, devoid of all any manual process. Many public sector institutions have now identified electronic Procurement as a cardinal for cutting waste in government procurement and have put measures in place to implement and adopt e-Procurement in their various procurement stages. This new process according to Birks, *et al.* (2001) is blessed with some success factors that could serve as a driving force in championing the process if appropriately utilized in the adoption and implementation process. Procurement practices in Ghana have gone through several of development, with the main purpose of reducing or at paramount minimising corruption in public procurement, realizing value for money, potency in the procurement process, among others. A major change was the enactment of the Public Procurement Act (Act 663) in 2003. As much as the usage of Act 663 has restructured procurement processes in the country, as well as establishing a high level of sanity in the procurement environment, its entirely manual base has compelled some procurement

ractitioners calling for the formulation of e-Procurement in the country (PPA EBulletin, 2010).

The traditional or manual processes are faced with certain challenges such as high cost and delay in the procurement process. Procurement and supply chain has the tendency of involving large quantities of paperwork in its operations, necessary for information communication with suppliers. The introduction of information technology and more integrated software systems has drastically the way business is contracted between parties. The advent of internet has facilitated the commencement and adoption of the new e-Procurement process in the area of procurement and supply chain management (Baily *et al.*, 2008). The internet has brought tremendous change in the way researchers do business in the world. It has increased the market shares, for example a wider customer reach and also reduces cost of its users.

Another area where the introduction of internet and ICT tools has made significant impact is speed and efficiency which is the cardinal principle of any procurement organisations. The internet can be used for both purchasing and delivery of goods. The manifestations of e-procurement can be seen in the online auctions where contracts are won and assets bought. It also makes use of online catalogue where documents such as purchase orders, bills of lading, invoices and delivery confirmations are carried out electronically (Baddeley & Kopelman, 2015). Additionally, e-Procurement also improves the transparency and accessibility of tender opportunities in public procurement procedures, as well as challenging greater competition across the world which add to economic growth (Bausà et al., 2013).

The significance of procurement in the business community cannot be overemphasized, as it contributes to almost one third of companies‟ overall budget for the purchase of goods and services (Zenz & Thompson, 1994)

Africa , Public procurement is still mostly manual, paper-based public procurement , this public procurement a reputation for inefficiency, corruption, and waste. It is where money, power, and discretion come together in government, making it government's number one corruption risk. Digitizing the entire procurement process through an electronic government procurement (e-GP) system holds the promise of transforming procurement to be more efficient, effective, and accountable. Yet, over the last few years across Africa, many governments have struggled to procure, build, and institutionalize e-GP systems despite millions of dollars in headline Public Financial Management reforms from donors, including the World Bank. Up to date some countries such as Ethiopia, Nigeria, Rwanda, Uganda, and Zambia have implemented E-procurement

In Rwanda, in an effort to reduce corruption, improve transparency and efficiency, and minimize potential collusion among bidders, several countries are establishing electronic government procurement systems, also known as e-GP systems. Rwanda is one of those countries. In fact, it is the first African country to implement an e-GP system nationally, and in a shorter span of time compared to other countries. Rwanda's e-GP journey has the potential of creating a ripple effect across the continent and beyond. The system is already delivering some benefits to users, as per their feedback. The system, for instance, has reduced time and allowed cost savings for both government officials and contractors, as the single online portal provided all the documents and information required, eliminating the need for in-person visits and printing costs.

According to Asian Development Bank Report (2013), government and other public institutions which have adopted the e-Procurement process have enjoyed numerous targeted benefits such as improved transparency, contract award notices, online bid submission and better tenderers participation due to improved information and access to opportunities. Other benefits include, faster processing of procurement activities as a result of online system,

enhanced tools to deal with corruption and fraud, as well as decrease in printing of hard copies for the purpose of documenting business transactions.

Therefore, this study aims at finding out the success story about the implementation and the impact of e-procurement on the performance of public institutions in Rwanda

1.2. Statement of the Problem

Public procurement especially manual, paper-based public procurement has a reputation for inefficiency, corruption, and waste. It is where money, power, and discretion come together in government, making it government's number one corruption risk. Digitizing the entire procurement process through an electronic government procurement (e-GP) system holds the promise of transforming procurement to be more efficient, effective, and accountable. Yet, over the last few years across Africa, many governments have struggled to procure, build, and institutionalize e-GP systems despite millions of dollars in headline Public Financial Management reforms from donors, including the World Bank.

To tackle today's operational problems, institutions employ ICT to enhance service to suppliers and other customers, decrease operating costs, and increase performance. The execution of procurement functions is influenced by online communication, online bidding, and automated bidding procedures in the supply chain. IT enables smooth and fast processes, effective information distribution, task and decision decentralization, increased transparency, and improved control with suppliers and organization to improve supply chain performance. Every department head is supposed to introduce electronic procurement and integrate suppliers into the system which will enhance the purchase goods/services/work at the right time, price, location, quantity, and quality for all users in the business so that the organisation benefits immensely and customers are better serviced (both internally and externally). E-

procurement and supplier integration has made it easier for organisations to purchase, and dispose of items. Most parastatal government officials/agents, however, are hesitant to embrace the concept of e-procurement and supplier integration which will improve the organisations supply chain performance. Local and international studies on e-procurement have been conducted. Beginning in 2014, the Rwanda government started the process of becoming the first country in Africa to realize those benefits, by partnering with a South Korean firm to develop its own e-procurement system. The government launched a pilot system in mid-2016 and rolled out e-procurement nationwide in mid-2017 (Diane, 2020).

As of December 2017, nearly 3,500 suppliers had registered on the e-procurement website, nearly 2,000 tenders had been advertised on the site, and 685 contracts had been signed. Tenders received four bids each, on average. As the system had only been fully operational for six months, and at that it was too early to tell if it had delivered the improved efficiency the government had envisioned. In theory, the system should have created time and cost savings for both government officials and contractors, as the single online portal provided all the documents and information required, eliminating the need for in-person visits and printing costs. (World bank report, 2017)

Despite the effort the government of Rwanda has made up to date there is still some flaws in public procurement. A study conducted by Transparency International Rwanda, Perceived corruption in Rwanda's public procurement system stands at 63.3 percent while 79 percent of government tender bidders admitted to have encountered corruption requests with 18 percent of them agreeing to pay. released early this month, said that at least Rwf14.2 billion (approximately $14.2 million) was spent in corruption instances in the past 12 months in the infrastructure sector alone. "Corruption in procuring infrastructure is unique and numb to

anti-corruption laws because it is a win-win situation, nobody reports nor complains," said Enock Byiringiro, a researcher at Transparency International Rwanda''

Up to date there is little research that was conducted to evaluate the role of E-procurement This research is aim to find out whether electronic procurement had an impact on the improvement of Public procurement procedures, especially in Rwanda.

1.3. Objectives of the study

The objectives of study can be classified into 2 categories, general and specific objectives

1.3.1. General objectives of study

The general objective of this study was to assess the impact of e-procurement system on the improvement of public procurement procedures in Rwanda.

1.3.2. Specific objectives of study

This study had three specific objectives as follows:

I. To analyze the effectiveness of E-bidding within a reference case of Rwanda
II. To examine the contribution of e-evaluation on improvement of public procurement procedures in Rwanda
III. To find out the contribution of E-contract on improvement of public procurement procedures in Rwanda

1.4. Research Questions

This study was answered the following research questions.

I. What are the benefits and challenges associated with the adoption of e-procurement in Rwanda?
II. To what extent E-bidding improved the efficiency of the public procurement cycle in Rwanda?
III. To what extent an E-evaluation contribute to the openness and transparency of public procurement in Rwanda?

1.5. Scope of the Study

This study was limited in domain, geographical, and time scopes.

1.5.1. Conceptual (or subject) scope

In terms of domain, this study is in domain of procurement where it highlighted the impact of E-procurement system on the improvement of public procurement procedures in Rwanda.

1.5.2. Geographical scope

In regard to geographical, the study assessed the current information from five District located in Northern Province

1.5.3.Time scope

In relation to time, the researcher analysed the improvement of public procurement procedures from before 2014-2017 introduction e-procurement system after 2017 to 2023 and after its introduction

1.6.Significance of the study

This study had many interests to different categories of people such as individual, social, academic and scientific interests.

1.6.1.Personal interest

This study helped the researcher to obtain a master's degree in business administration. It also helped the researcher to improve my knowledge in relation to with Procurement procedures in public institutions.

1.6.2. Social significant

The results of this study helped decision makers of public management, to strengthen the use of E-procurement system in publication of all tenders in order to improve its procurement procedures.

1.6.3. Academic and scientific interest

The final document of this study were used by next generation of Kigali Independent University especially the students from Masters in business administration. Scientifically, the study added knowledge and complete the gap left by previous researchers and academicians.

1.7. Structure of the study

The first chapter is about the general introduction to the study which consists of background, problem statement, objectives of the study, research questions, research hypothesis, scope of the study, significance of the study, definition of key terms as well as structure of the thesis. The second chapter dealt with the literature review comprising of a conceptual review and theoretical framework; the chapter also critically reviewed the previous studies related to the topic and draws inferences expected to help explain conceptual framework. Chapter three was about the research methodology containing the research design and the methodology of the study including research design, population of the study, methods and techniques that used in sample selection and data collection. This includes the manner in which data collected and analyzed. Chapter four dealt with data presentation, findings and discussion. Chapter five reflected the summary of findings of this study. It also included conclusions and recommendations as well as areas for further studies

CHAPTER 2: LITERATURE REVIEW

Introduction

This chapter gives an overview on historical development of public procurement in Rwanda and deals with the general considerations on procurement and public procurement. It also analyses the electronic public procurement in Rwanda in comparison with other countries.

2.1. Conceptual review

This section, introduce the historical development of public procurement in Rwanda, it defines the main key concepts of research variables, such as e- procurement and e-tender, etc…

2.1.1. Overview of procurement

Procurement is well defined as the purchase of works, services and goods (Baily et al., 2008). Kidds (2013) defined Procurement as "the business supervision function that ensures the noticing, requisition, payment and administration of the external resources that an organization requirements or may need to meet its planned objectives".

Procurement includes activities that precede as well as follows the signing of a contract between parties involved. Weele (2010) also defined Procurement as "the process of managing external resources in order to make sure that the supply of all goods, works services, functionality and knowledge which are essential for operating and sustaining the company's principal and support activities are safeguarded in all possible regards Public procurement is the practice whereby public sector institutions purchase (procure) goods, services and works from contractors. (Office Government Commerce, 2007).

Chartered Institutes of Purchasing and Supplying Australia (CIPSA) (2005) has outlined seven core benefit that any company is likely to gain in the procurement process. These, according to CIPSA (2005) include the security of supply, greater added value, improved quality, lower costs, reduced risk, increased efficiency and innovation**.**

2.1.1.2. Traditional Method of Procurement

Mathonsi and Thwala (2012) state that this method is called "traditional procurement" because it has been in existence for a long time and has been the only choice available for most institutions since time long-standing. The existing procurement process is for procurement entities necessitates procurement entities to put an advertisement or notice in a daily newspaper or site a announcement on a notice board, or send a request to selected list of contractors registered with the firm. The contractors will then interact with the entity to obtain a tender document, attend a pre-tender meeting and then submit their tender proposal directly to the entity. Normally the government procedure is carried out in more regulated and organize procedure. It is also defined by laws and financial administrative processes (Asian Development Bank, 2013).

It is the procurement entity that is in charge of all activities leading to the award of contract. This involves the creation of tender document for multiple interested tenderers, and also sending notices to tenderers of any changes to the tender document with answers to questions. The newspaper announcements and the administration of the whole tender processes and resources can be very expensive and not always productive. In some develop countries, the procurement operation is consolidated in designated entity administrative outfits to present enhance control and supervision of the process (Marco, 2010).

The Chartered Institute of Building (CIOB) report, (2010) demonstrated that traditional method, has its flaws. Weaknesses with traditional are, however, apparent.

This practice has inadequate entry to the opportunity and the use of a registered suppliers or outside suppliers impact the procurement operation. A long chain of internal authorization and scrutiny is required to complete the procurement process (Chomchaiya, 2014). According to Okuadjo (2010), entities that carry out procurement operations must make sure that they are governed by the following processes:

- Planning - This enables procurement requirements to be determined and indicated by the user client which are collated according to their similarities. It also embraces the procurement methods and rules to be followed;
- Sourcing - This is the pre-qualification stage where potential suppliers request for quotation (proposal), examination of responses and the selection of the successful tenderer. Negotiations take place at this stage;
- Contract & Contract Management - This is a stage allows the parties involved to draw up contract document using the agreed terms and conditions, and signing where applicable. The awarded contract is administered, to guarantee that both parties execute their obligations under the contract;
- Storing - This stage allows for unused supplies to be kept safely in order to prevent any damages in the course of the contract execution;
- Distribution – Stored goods are delivered to their ultimate destinations in accordance to what is stated in the condition of contract;
- Disposal – This stage involves the disposing of obsolete or surplus stocks either by selling to a public tender or auction, or by transferring the unused goods to another public organization if need arises; and Evaluation - It is impotant to appraise the

progress of the procurement operation at every stage so as to identify any weaknesses or shortfall and for appropriate remedies to be taken where necessary

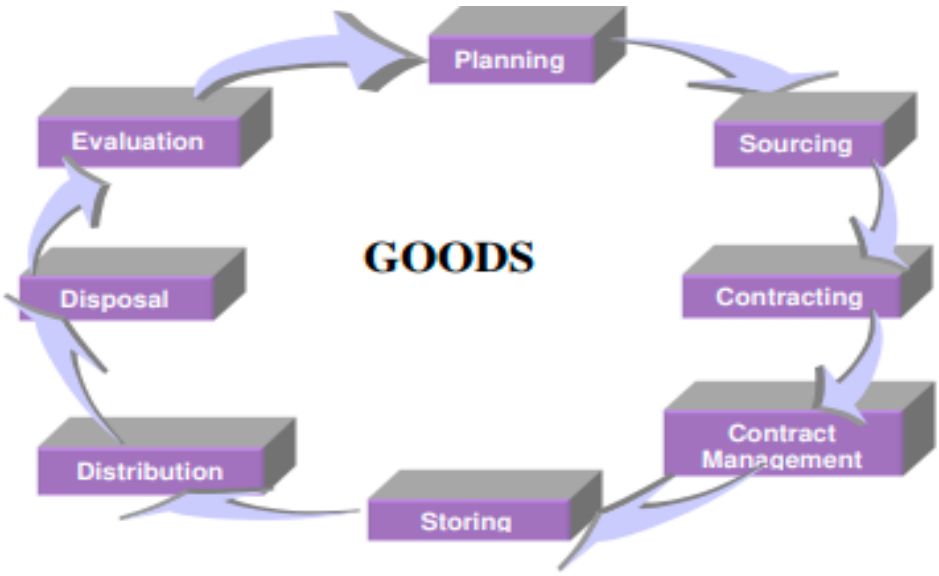

Figure 1: Procurement process

Source PPA, 2010

2.1.1.3. Challenges with the Traditional (Manual) Procurement Method

Procurement of contracts has been subjected to extensive of "criticisms" over the years, where the negative experiences significantly supersede the good practices. Some of these criticisms include:

Too cumbersome, expensive and bureaucratic processes involved public procurement processes usually pursue a very complex and strict guide imposing high levels of bureaucracy, and its cumbersome nature, such as the submission of various statuary certificates and additional overhead charges. Tavares (2012) explained these effects to be particularly harmful to Small and Medium Enterprises:

Discrimination and delay in issue of tender schedules to suppliers: Government sectors are responsible for regulating the issuance of tender documents to the prospective tenderers, after necessary verifications have been completed.

There exists an element of discrimination and unfairness in this process, in addition to delays in the preparation of tender road map in the Government institutions. As a result, tender documents were not usually issued to tenderers on the announced dates (Tavares, 2012; Bikshapathi, 2006);

Tender Boxes at Multiple locations :In an attempt to counter the threat of contractors‟ alliances and physical threats to tenderers, some Government sectors keep the tender boxes at multiple locations for easy access. Instead of yielding the desired results, this practice rather exposed departmental officials who attend to these boxes to various forms of risks in the course of their duties. Physical transportation of tender boxes with sealed tender documents from multiple locations to a central point also tends to be risky tasks to officials (Bikshapathi, 2006);

Tampering of tender files; Due to the transportation of tender documents across various hierarchies, documents are exposed to the risk of manipulating or loss in the course of their transportation. The manual transportation of tender documents is also a cumbersome and time-consuming process (Chomchaiya 2014);

Delays in finalization of tenders; Lack of transparency, and manual movement of files across the administrative hierarchy leads to undue delays in the conclusion procedure. These delays contribute to cost and time overruns for the work (Chomchaiya 2014; Bikshapathi, 2006);

Human interface at every stage; The manual system leads to the continuous face to face interaction of the parties involved at every stage of the process. Such repeated contact between bidders and departmental staff could result in partiality, favoritism and other detrimental practices (Costa, 2013); and **Lack of Transparency**; Government departments closely monitor and control the procurement process due to its sensitive nature to both the companies and the parties involved leading to a severe lack of transparency in the entire process. This lack of openness gives birth to misinformation and a lack of confidence in the entire system (Subramariam & Shaw, 2002; Bikshapathi, 2006).

2.1.5.Historical development of public procurement in Rwanda

The Public Procurement System in Rwanda has evolved from a crude system with no regulations to an orderly legally regulated procurement system. From the use of 1959 law in public procurement in Rwanda to the Public Procurement Law enacted in April 2007, Rwanda moved towards a national public procurement system which respects international standards.

As in many other countries, the use of the Country Procurement System in Rwanda was adapted following the Paris Declaration on Aid effectiveness endorsed on 2 March 2005 and Accra Agenda for Action drawn down in 2008 that is embedded in a set of five inter-related principles whose aim was to make aid more effective and accountable to the benefiting communities (TIR, 2016).

2.1.5.1. E-government procurement

According to the World Bank (2003b), e-GP is defined as: “the use of information technology (especially the internet) by governments in conducting their procurement relationships with suppliers for the procurement of works, goods, and consultancy services

required by the public sector." The World Bank further defines e-GP under the headings e-tendering and e-purchasing. An e-tendering solution is used for procurement of specialized works, goods and services, characterized by high-value and low-volume transactions. Procurement of standard goods and services is addressed using an e-purchasing solution, characterized by low-value and high-volume transactions

2.1.5.2. E-procurement

According to European bank (2015), E-procurement (electronic procurement, sometimes also known as supplier exchange) is the business-to-business or business-to-consumer or business-to-government purchase and sale of supplies, work, and services through the Internet as well as other information and networking systems, such as electronic data interchange and enterprise resource planning.

The e-procurement value chain consists of indent management, e-Informing, e-Tendering, e-Auctioning, vendor management, catalogue management, purchase order integration, Order Status, Ship Notice, e-invoicing, e-payment, and contract management. Indent management is the workflow involved in the preparation of tenders. This part of the value chain is optional, with individual procuring departments defining their indenting process. In works procurement, administrative approval and technical sanction are obtained in electronic format. In goods procurement, indent generation activity is done online. The end result of the stage is taken as inputs for issuing the NIT.

Electronic procurement, popularly referred to as e-procurement is one of the recognized procurement best practices. It plays a central role to the performance of the procurement function and that of the organization because other best practices like green purchasing, partnering, Total Quality management (TQM), Just-In-Time (JIT) and risk management apply the concept of e-procurement or Information Communication Technology (ICT) applications. Gattorna (2010) identified e-procurement as one of the dynamic procurement processes because of its strategic, innovative and responsive procurement process; it can influence outcomes of performance and drive improvement in the whole supply chain. Employment of e-procurement requires an overhaul of the whole supply chain process. The process involves automation of the procurement process of requirement identification, sourcing, bidding, payment, records and supplier management relationship (Ageshin, 2001).

According to Fantazy and Kumar (2010), electronic procurement is the use of technology in procurement system as means of enhancing procurement system and achieving the satisfaction of procurement beneficiaries. Through this procurement system, there is a direct relationship between producers and suppliers for goods and services. Therefore, electronic system helps to identify and manage internal opportunities among service providers and service beneficiaries.

E-procurement refers to the process of purchasing goods and services electronically (internet-enabled) required for an organization's operation (Mitchell, 2000 and Watuleke, 2017). Instead of physical exchange or touch, it includes electronic interaction with or with parties involved in the procurement process.

The application of electronic alone as internet based system does not implies the successful implementation of services delivery. Therefore, this system requires technical experts as supportive for implementation process.The use of technology in procurement has become an

important tool of enhancing efficiency and effectiveness of services delivery for all profit making and non profit making organizations.

However, to succeed in service delivery, technology, information and communication play a great important role even if some obstacles continue to occur during the implementation process (Birks & Rad, 2001).

2.1.5.3 E-procurement in frauds reduction

Frauds in procurement process occur worldwide and remain a very serious problem in developing countries. Both private and public procurement institutions apply to electronic procurement as this is more accurate and effective. The most frauds occurring in public procurement is caused by use of traditional paper-based purchasing system. However, there is a need to enforce rules and laws to secure contractors (Bhattarai, 2013).

Frauds in public procurement occur at national and sub-national level. The direct costs of corruption apply to loss in public funds, misallocation, other expenses as well as low quality of goods, works and services during working progress. Corruption is difficult to measure as it is hidden in the nature. The information revealed that between 10-30% of investors in construction projects and other profit-making activities incur such corruption and mismanagement (Vaidya & Callender, 2006).

As corruption present significance impact on business profit and organization economy, both public and private institutions become more victim as this constitute a barrier towards competition and access to market share. More companies adopt fair procurement system based on electronic procurement system to increase profit margin and achieve customers awareness (Birks, & Rad, 2001).

The rate of frauds in procurement process occurs in developing countries and this occurs during tendering and contracting processes. However, this problem recalls taking core strategies and preventive measures to achieve goals and objectives (Basheka, 2009).

To increase awareness among bidders in terms of procurement system, taking procedure and strategies become an important aspect.Accecibility, userfriendly, timely process, effective follow up are important aspects of reducing corruption.Therefore, bidders are involved in decision making for clear and effective procurement system (Ware & Noone, 2012).

According to Pathak and Rahman (2009), information, technology and communication is used as means of acquiring goods and services, designing contracts to bidders and management. Technology in procurement system remains an important aspect in channeling market access and fair competition, promote integrity reduces associated costs, ensures quick and enough information, transparency as well as accountability.

Corruption occurs in public sector where large funds are observed. The adoption of electronic procurement system reduces frauds as this system detects and prevents the occurrence of frauds in procurement programme. The information collected from tenders, bidders and contractors are used to assess the extent of procurement system as contrasted. For instance, this data could allow ex-ante monitoring and ex-post analysis of indicators of corruption (e.g. number of contracts awarded to the same bidder, number of bidders, etc.), and data mining techniques could be used to detect anomalies in the data, revealing potential cases of fraud or corruption (Neupane and Vand, 2012).

Administrative transparency consists of ensuring the highest circulation of information, both inside and outside a public authority. E-procurement could improve transparency, for example, automating the online publishing of tender documentation and the outcomes of procedures (winning suppliers, ranking, clarification requests, etc.).

2.1.5.4 E-procurement in increase competition

E-procurement become more relevant as it increased competition through market share. The supply side becomes more aware of procurement system and competition which allows determining and designing quality assurance, timelines, innovation and fair price. Technology in procurement system increased knowledge for designers, users, beneficiaries and removed inequalities of participation on competitive market (Arrowsmith, 2010).

E-procurement may bring about both positive or negative effects in competitive market. This implies that competitive market structure is maintained through suppliers with incentives to invest and bringing innovative ideas or those intending to bring changes in productive industry (Ricker & Kalakota, 2009).

Electronic procurement allows complex competition in both public and private sector. Establishing strong rules becomes more relevant in public sector procurement as this enhances high chances of succeeding in either national and international competition.Public procurement practices requires step by step assessment to ensure its success and effectiveness (Deise & Wright, 2000).

In public sector, where there is open competition, electronic procurement is designed to empower buyers for easy accessibility of goods and services and achieving market demand and customer satisfaction.Therefore, electronic procurement offers customers ability towards their needs, and level of satisfaction (Oughton, 2005).

2.1.5.5 E-procurement in time management

According to Snider and Rendon (2001), e- procurement in supply chain management is important aspect in the reduction of time as this encourages faster and faster procurement

process. With time management resulting from e-procurement, customers' value creation is observed and this allows them to operate with lower assets base.

Time management resulting from e-procurement system is used to get goods at the right time to the light customers. With time management, institution is responsible to minimize transaction costs of seeking customers. However, the use of internet network has reduced transaction costs (Ricker & Kalakota, 2009)

Time management practices focuses on transportation costs, picking orders in procurement process which leads to the increase in revenue. Time management emphasizes element of accountability, checking, and evaluating the speed of procurement process. E-procurement facilitates bidders to get accurate orders timely and this leads to real time of information which assist to reduce errors in procurement process (Ricker & Kalakota, 2009).

2.1.5.6 E-procurement in reduce cost and price of procurement process

According to Eadie *et al* (2007), an organization which uses E-procurement has the following advantages: First, Price reduction in tendering: Empirical studies carried out Gebauer *et al* (1988) in the United States of America indicated that the two most important measures for the success of procurement processes are cost and time.

In this method, there is no paperwork, postage fee and other costs associated with preparation and sending tender documents. It is also faster to send a document electronically as compared to the traditional method of sending tender documents through post office. It results to improved order tracking and tracing, for it is much easier to trace the orders and make necessary corrections in case an error is observed in the previous order. Secondly, there is reduction in time to source materials:

In Reduction in time has been proved as a relevant benefit by Knudsen (2003) quoted in Eadie *et al* (2007), who says "E-procurement is a rapid efficient method of finding and connecting new sources, being a lean channel for communication". A lot of time is spent on paper invoicing in terms of writing, filing and postal communication but while in e-procurement, staff have sufficient time to engage on strategic issues of procurement.

Thirdly, Lower Administration costs: in his research, Rankin (2006) argues that e-procurement results in reduction in paperwork and this leads to lower administration costs. Fourthly, Reduction in procurement staff: since most of the procurement process is done electronically, the number of staff needed to facilitate the process reduces. As Eadie et al (2007) noted, the reduction in staff is an important way of producing competitive advantage through reduced costs. The time wasted in moving from one town or country to another to look for a potential supplier or buyer is greatly reduced since with a click of a button, you can readily get the information in the internet. By extension, E-procurement leads to reduction in maverick buying. Maverick buying is when staff buys from suppliers than those with whom a purchasing agreement has been negotiated.

This is further supported by Egbu *et al.* (2003) in their study which revealed that through implementation of an e-procurement system, a steel supplier was able to carry out a multi-million-pound project with only 20% of the staff the company would normally have used. Fifthly, e-procurement gives an organization competitive advantage over its competitors. As a centralized department can oversee all procurement activities and different offices worldwide can access the same documentation when required, this gives a distinct advantage over the much slower process of having to post documentation between offices.

2.1.6 Improve Communication

Another benefit of e-procurement is improvement of communication: Eadie *et al.* (2007) argue that e-procurement allows sections of electronic documentation to flow through the supply chain; it improves the speed of returns and subcontractor price visibility. He further notes that since it is easier to communicate requirements in a quicker more accessible manner, it will result in a better understanding of requirements and due compliance besides allowing clients to gauge the state of the market by seeing how much interest is shown in the tender.

2.1.7 Increase in revenue

According to Buhari (2001), revenue is an income generated by government in terms of taxes, rates, fees, fines, duties and penalties, rents, dues, proceeds and other receipts of government. The more service delivery is of quality especially in e-procurement system, this increases the number of bidders on market place which therefore reflect on increased revenue.

The revenue generation as output of bidders in e-procurement is normally used in different ways like budgeting, social service to the population and yet is basis of further investment to the government. Service delivery is conceptualized as relationship between policy makers, service providers and poor people. Better service delivery leads to the chance of raising revenue which is used for infrastructural development. (Berry & Moreno, 2004)

The increase in revenue within public institutions resulting from e- procurement has the main objective of reducing spending in public activities which requires relying on external efforts which generate more efforts. However, less spending has short term effects on real output.

All public and private institutions are determined by comparative advantages by focusing on different key areas of revenue generation (Afuberoh & Okoye , 2014).

E- Procurement within public sector is important in raising economic benefits and helps the government to progress. Technology in procurement system is important aspect of achieving social and economic improvement targets as this brings added advantage to better services delivery, transparency and increased gross domestic products.(GDP) (Arrowsmith, 2010).

2.1.5.7 E-procurement in effective planning

Technology in procurement requires careful planning system to facilitate the potential information and communication in procurement system. The planning is the tasks of all policy makers to avoid all constraints of procurement system. Planning is the primary function to achieve goals and objectives. It must be supported by information communication technology which is helpful to ensure reliable data base. Planning for electronic procurement is to use modern way of procurement system rather than paper based procurement as better way of ensuring customer satisfaction (Gul, 2010).

To ensure effective public procurement, planning is an important aspect before and after which leads to better service delivery. Therefore, customers' satisfactions are recognized. Planning provide the possibility of conducting public procurement procedures in electronic form and therefore provides the precondition for its application (Birks, & Rad, 2001).

According to State of Department of Florida (2012), effective planning is based on different aspects like the organization structure, legislation, organization notices, skills development, and organization renewal and core competences of employees. Planning for public procurement ensures good governance and transparency.

The relevance of planning is that organizations are able to maximize all benefits as this offers integrity of operation system, trust and quality. The developed countries are determined with strong plan and this has led to feasibility of achieving goals and objectives. Thus, proper planning helps institutions to deal with large suppliers within competitive market (Sweeney, 2006).

2.1.5.8. Procurement process

Procurement Process The procurement process can be described as "the business process of selecting a source, ordering and acquiring goods and services" (Bodnar and Hopwood, 2004). They stated that the common steps of the procurement process are:|" requirement determination, source selection, request for quotation, selection of vendors, issuance of a purchase order, receipt of the goods, invoice verification and vendor payment" (Ibid,2004).

They explained that the first step is the Requirement determination which is a procurement process of acquiring goods or services that are demanded by users of the purchasing firm. generally, a purchase requisition is an internal document that presents the demand for procurement of goods and services, it ensures the availability of products at a specific time. The purchase requisition must be approved by the procurement manager or someone of an equivalent position, and it must be within the cost limits fixed by the procurement manager. The second step is Source selection which is the process of conveying a source of supply to the purchase requisition. It helps to know if there is a contract between the company and the supplier who must supply the requested products. If they have the contract, then the appropriate purchase amount request will be proposed. In case, there is no contract then a "request for quotation (RFQ)" document is sent from to the chosen suppliers once the request for quotation is sent the next step is the selection of vendor, they stated that the qualified supplier is selected according to the list of criteria which shows what the buyer want. Besides

that, they also look at the delivery report of previous orders, the quality and service of the products as well as the level of service given by the chosen supplier. The next step is an Issuance of the purchase order, once the purchase order is received, then the next step is to prepare the contract.

The contract shows the agreement the buyer and chosen supplier and different task that has to be performed by the chosen supplier at a certain period of time. Once the contract is made the next step is to make the receipt of goods which are prepared the time the supplier provides the pre-arranged delivery.

From there the next step is Invoice verification, which confirms that the required costs and quantity have been fulfilled.

And the last step of the procurement process is Vendor payment which is the payment made to the supplier and the payment is done when the invoice verification is approved. Van Weele (2005) depicts the general procurement process, which can be found in the figure below. The figure illustrates the different procurement activities, ranging from the need for an internal customer to delivery from the supplier. The author divides the procurement process into two parts: the tactical purchasing and operational purchasing. The tactical purchasing is composed of three phases: the first phase is the specification, in this phase, all the requested materials and services for preserving and developing direct and indirect production activities are identified. The second one is the selection of suppliers, it refers to the identification, evaluation as well as the selection of a supplier among other suppliers. The third one is Contracting – in this phase, the prices are negotiated, and the contracts are concluded with the suppliers. The fourth one is ordering, in this phase goods and services are ordered from the selected suppliers with whom contracts have been done before. The fifth one is monitoring it consists of tracking deliveries of goods and services that must be in accordance with those set

in the contract. The last one is evaluation, in this final phase, the analysis of the purchasing process is done

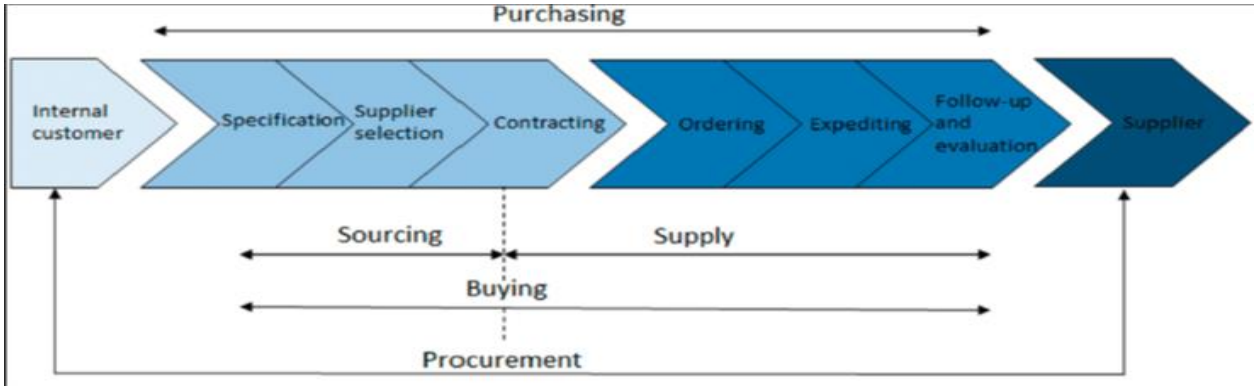

Figure 2:Procurement Process by Van weel, 2005

E-procurement refers to the use of internet-based information and communication technologies to carry out stages of the procurement process, as depictured above, such as supplier selection, sourcing, contracting, ordering, expediting, and evaluation (Croom and Brandon-Jones, 2005). There are various forms of e-procurement concentrating on the different stages, according to Boer, Harink, & Heijboer (2003) there are basically five main forms of e-procurement: e-sourcing, e-tendering, e-auctioning, re-ordering /web-based ERP and e-informing and below is the description of e-procurement forms E-tendering: "E-tendering refers to the process of sending RFI (request for information) and RFP (request for proposal) to suppliers and receiving their response using internet technologies. Often e-tendering is supported by an e-tendering system that can analyse the responses received from the suppliers" E-Sourcing It is the use of web-based collaborative tools to identify new suppliers for a specific purchasing category. It can be used to pre-qualify suppliers and, also identify suppliers that can be used in the selection phase. A purchaser can, by identifying new suppliers, maximize the competitiveness during the process of tendering in the case of this procurement category.

In addition, the supply risk associated with this category can be decreased through e-sourcing (Kraljic, 1983). There are major possible benefits arising from finding the best and cheapest supplier (Aberdeen Group 2001).

E-noticing Broadcasting of opportunities offered by procurement entities and contracting authorities to open competitive procedures. The electronic notices are an electronic document comprising key essentials in the procurement process and disseminated through the web notification systems and other electronic channels. E-Access: Non-discriminatory electronic access to tender documentation and requirements as well as additional associated documents are available and helpful for the preparation of a bid, such as clarifications, questions, and answers. E-Submission: Submission of offers to the contracting authority/entity in electronic form that can obtain, approve, and process them in accordance with legal requirements

E-Evaluation Electronic data of shortlisted applicants are extracted from tenders and evaluated by a committee using appropriate software to obtain the details of each contractor in terms of the statuary and Criteria for commercial conditions and awards (Maia & Tavares, 2013). E-award and e-contract The contracting authority then awards the contract through the electronic platform and the econtract will be easy is recorded and stored into a central procurement platform. The e-contract includes the electronic contract between the contracting party and the winning bidder. It also enables electronic surveillance of contracts (Vaidya et al, 2006; Hsao and Teo, 2005) E- contract execution The execution of the contract follows the contract award complete with the e-platform, conducting the key tasked of all the electronic processes involved in the successful execution of the project (Ferreira & Spinola, 2013). It includes e-ordering to facilitate the operational purchasing process, including requisitioning, order processing, order approval, the transmission and acceptance of this by suppliers (Croom & Brandon, 2005).

E-Invoicing ensures invoices from suppliers are received electronically, processed and finally making electronic payment to suppliers via a Bank Automated Clearing System (BACs) (Doherty, et al., 2013).

2.1.5.9. Benefits of e-procurement

According to Eadie et al (2007), institutions that use E-procurement can account the following benefits: Price reduction in tendering: The Empirical research conducted by Gebauer et al (1988) in the United States of America mentioned that cost and time are the most significant indicators of an effective procurement process.

They added that with the use of e-procurement process there is “no paperwork, postage fee and other costs associated with the preparation and sending tender documents”. Besides that, it is fast to send documents electronically than sending them through a post agency as it is easy to trace and track orders and once there is an error it easy to correct it

Reduction in time to source materials: time reductions have been demonstrated by Knudsen (2003) quoted in Eadie et al (2007), who says: "E-procurement is a rapidly successful way to identify and link new sources, a lean communication channel." There is a lot of time spent on printing, filing and postal correspondence on paper invoicing, so although in e-procurement, workers have more time for strategic procurement issues, it is much less time than to travel from one city or country to another to search for a potential supplier or consumer as the details can be readily accessible on the internet by just clicking the button. The system helps government agencies make informed and specific decisions by providing easy access and detailed information on-offer and competitors. Furthermore, E-procurement reduces the maverick buying. “Maverick buying is when staff buys from suppliers than those with whom a purchasing agreement has been negotiated” (Eadie et al, 2007).

Moreover, (Nawi et.al, 2016) states that applying an e-procurement system is a faster government procurement process and higher transparency compared to traditional procurement.

Lower administrative costs: Rankin (2006) claims in his research that e-procurement decreases paperwork, contributing to lower administration costs.

Organizations deal with large numbers of requisitions every year, many of which refer to low-value items. Traditionally these processes have been paper-based and have required considerable manual labour and other costs such as intra-company mail, phone charges, postage, photocopying and storage. E-procurement automates the entire requisition-to-payment process, increasing efficiency and eliminating unnecessary expenses. Furthermore, the automated system can also reduce those costs associated with data errors and inaccuracies inherent to manual processes (Morris et al., 2000; Rayport and Jaworski, 2001; Smart and Harrison, 2003). Furthermore, since most of the procurement process is done electronically, the number of staff needed to facilitate the process reduces. Eadie et al (2007) indicated that the reduction of employees is an effective way to achieve competitive advantage by reducing costs. This is further confirmed by Egbu et al. (2003), who found that a steel provider was able to complete a multi-million-pound project with just 20 percent of the company's workforce by introducing an e-procurement system. **Improvement of communication and information flow:** Eadie et al (2007) argue that e-procurement allows sections of electronic documentation to flow through the supply chain; it improves the speed of returns and subcontractor price visibility. He further states that because communication of requirements is simpler more quickly and affordably, it would also lead to a clearer understanding of requirements and enforcement and enable consumers to assess the current state of the market by looking at how much interest the contract shows.

Moreover, A recent survey looking at the benefits of e-procurement (Croom, 2000) revealed that around 46% of respondents believed that e-procurement would help improve information flow, and 41% answered that e-Inventory reduction procurement would lead to better internal and external communications.

Improved planning and control: E-procurement systems provide consolidated details of actual spend with each supplier and in each product category, which are an essential input for planning and control.

In addition, surveys found that e-procurement companies are investing less time on operational activities and more time on strategic issues (Flicker and Holler, 2000). Another survey indicated that over 40% of respondents believed that e-procurement would lead to improvements in planning (Croom, 2000). Improved cooperation with suppliers: e-procurement applications from Hoque (2000) enable businesses to develop and maintain long-term relationships with suppliers. This can lead to further improvements in terms of contract compliance, collaboration and error rates (Fisher, 2000). Moreover, (Eaddie et al, 2007) state that, suppliers can be monitored on timely delivery and quality delivery of products) and every prospective supplier and buyer is always accessible to his/her convenience. The result is not only greater market access but also increased productivity (Ibid)

Inventory reduction: Shorter cycle times reduce stocking requirements, bringing with it a reduction in inventory levels and the cost associated with them. This inventory reduction can also have a strong positive impact on cash flow since the money tied up in inventory can become available for other purposes (Morris et al., 2000).

Shorter order cycle times: The automation and workflow facilities of e-procurement applications allow organizations to reduce the cycle time of purchases (Morris et al., 2000), improving the overall flexibility and responsiveness of the system

2.1.5.10. Challenges of implementing E-procurement

Despite the benefits of using electronic procurement, still there are challenges related to the adoption of e-procurement (Uddin, 2015) such as lack of system integration and standardization problem because e-procurement is still a new system application used in business and is not easy to get referral models.

Moreover, Uddin (2015) stated that the immaturity of software and the absence of certain essential features like the one for payment and invoicing reconciliation is also a problem. Besides that, there are potential hidden costs associated with the adoption of e-procurement, such as "systems integration, content aggregation, and rationalization". (Uddin,2015) as well as training and reengineering costs (Ibid). Furthermore, he added that lack of supplier preparation, tender preparation, and immaturity of the vendor of e-procurement solutions as well as resistance to change of end-user are also challenges. The immaturity of e-procurement service providers and the lack of vendor preparedness and end-user resistance is also challenging (Uddin 2015, Angeles and Nath, 2007). According to Alshehri and Drew (2010), poor IT infrastructure is a big challenge for e-procurement adoption. Without a good IT infrastructure is almost impossible to transform, store and share crucial information needed to perform procurement activities. Moreover, (Pastore, 2002; Chaffey, 2002; Segev et al., 1998) stated that the immaturity of the technology is a challenge. this is expressed in a variety of issues such as safety, reliability, and linkage with other systems and poor Internet connection. Poor electricity is also a challenge (Mutula and Mostert, 2010). Suppliers' resistance to change is also another challenge. In the process of introducing e-procurement initiatives,

buyers have to contend with the technical immaturity and unreadiness of suppliers (Rebecca Angeles and Ravi Nath, 2007). Min & Galle (2001) stated that small businesses are generally resistant to innovation and lack the technological skills needed

2.2. Theoretical Literature Review

In modern times, a number of theories have been put front in relation to e-procurement and public procurement procedures. In session, several theories such as Dialectical theory , Agency theory and stakeholder management theory, Strategic purchasing theory, etc.. were introduced. There are briefly discussed here under.

2.2.1. Dialectical theory

Dialectical theory begins with the Hegelian assumption that the organizational entity exists in a pluralistic world of colliding events, forces, or contradictory values that compete with each other for domination and control (Van de Ven& Poole, 1995). These oppositions may be internal to an organizational entity which may have several conflicting goals or interest groups competing for priority. But oppositions may also be external to the organizational entity. Van de Venand Poole uses dialectical theory to explain change in organizations as occurring when the opposing values, forces or events gain sufficient power to confront and engage the status quo. These opposing forces are termed thesis and antithesis, thesis being the status quo or the ruling way of "doing things". In such situation a new "synthesis" is developed which at a later stage becomes the status quo and again may be confronted by an opposing force. It must be added that the new situation or "way of doing things", the synthesis is not necessarily progress to a better state.

Using dialectics will imply identifying challenges and dilemmas in terms of dialectical contradictions or theses and antitheses, and through data collection also identifying possible

synthesizes or solutions. These may be in the form of work around, e.g. by specifying requirements which favor other goals than just costs. Findings from two case studies of procurement in local government identify different tensions in the procurement process (Moe et al, 2006). However dialectics serves a limited role as analytical lens in identifying conflicts.

The theory above states that the organization has a number of conflicting interests which compete for priority. It suggests that change in an organization occur when the opposing interests gain sufficient force to confront the usual way of doing things.

This study investigates on the Effects of e- Procurement on the Performance of County governments in Kenya. It analyzes E-Procurement as a competing force which has confronted organizations including County Governments in Kenya to accept change by adopting e-procurement.

2.2.2. Agency theory and stakeholder management theory

Agency theory attempts to describe the agency relationship, in which one party (the principal) delegates work to another party (the agent), who performs that work (Eisenhardt, 1989).Two problems can arise in such relationships, the desires and goals of the principal and agent can conflict, and it is difficult for the principal to verify what the agent actually is doing. Principal–agent researchers are concerned with a general theory of the principal-agent relationship, a theory that can be applied to employer-employee, buyer-supplier and other agency relationships. Agency theory is most relevant in situations in which contracting problems are difficult.

These include situations in which there is a substantial goal conflict between principals and agents and sufficient outcome uncertainty to trigger the risk implications of theory

(Eisenhardt, 1989). Eisenhardt discusses the assumptions of the theory and raises the issue of principals learning about the agents when there is a long term relationship, when there may be less need for outcome- based contracts. This may be more the case with procurement in the private sector, where there are fewer regulations than in the public sector, and where tendering is not required. Private businesses are free to have long term relationships with software developers and consulting firms. Jones (1995) suggests that long term relationships with vendors may in the long run lead to higher effectiveness, due to the stability of the relationship being dependent on controlling goal conflicts.

Sharma has extended the agency theory and focuses on the principal-professional relationship, where professionals can include consultants (Sharma, 1987). It is not uncommon for public entities to use IS-consulting houses in specifying requirements and even in the tendering phase and the selection of vendor. According to Sharma (1987), there are some specific distinctions of the principal-professional agency exchange. The greatest is the power asymmetry. In an owner-manager or manager-worker relationship, the principal have the power to design and enforce contracts and hence the power to enter or to dismiss incentives for the managers and the workers. In contrast, principal-professional exchanges are inherently those in which professionals have the power over lay principals by virtue of their expertise, functional indispensability, and intrinsic ambiguity associated with the services they provide. It also involves a considerable information asymmetry; the principal does not only know how the professional agent does the job, but also not what he or she does. This information asymmetry also makes it difficult for the principals to know beforehand how much service is actually needed. Dawson has expanded Sharma's work to study information asymmetry in IS consulting.

Procurement can be viewed as involving at least two parts with different goals, a buyer and one or more vendors competing for the contract. However in addition to the agency relationship between buyer and competing vendors, there may be a number of internal stakeholders possibly with conflicting goals, adding complexity to the procurement process. These groups of internal stakeholders may include IT staff, procurement personnel, users, user representatives, line managers, financial officers and cost controllers. These may have conflicting interests even though there may not be an agency relationship between them; one common observation is that different user groups in different parts of a business may have conflicting requirements.

Stakeholder management theory is helpful in this study which investigates on the Effects of e- Procurement on the Performance of County governments in Kenya. It assesses how E-procurement may be used to bring accountability and transparency thus strengthening the relationship between county procurement personnel and other stakeholders such as the county government, suppliers, the public, independent authorities, and national government authorities. Stakeholder relations theory: Eisenhardt and agency theory has been influential development of stakeholder theory (Jones, 1995, Hill and Jones, 1992) Flak and Rose (Flak and Rose, 2005) have done a thorough literature study of stakeholder theory and discusses the strengths and weaknesses of the theory for theoretical contribution to the e-government field. Jones defines stakeholders as applying not only to groups easily characterized by words such as customers or employees but also to subgroups of customers and employees (e.g. shop workers and middle managers) who may have distinct and competing interests. This study investigates on the Effects of e- Procurement on the Performance of County governments in Kenya. It identifies different stakeholders, what conflicting goals or interests they may have, and to what extent this influences the process. Two obvious groups of stakeholders which may have conflicting goals are procurement officers in the County government and other

stakeholders whom they are accountable to. There may also be conflicting goals between different external stakeholders such as vendors and the public. The study aims to evaluate the effectiveness of E-procurement in streamlining organizational processes for overall performance of the County government with the end result being good stakeholder relations

2.2.3. Strategic purchasing theory

Chen, Paulraj and Lado (2004) in their optics states that strategic purchasing is a vital link in a working supply chain.

According to this view strategic purchasing can give a firm a competitive advantage by enabling the firms to: foster close working relationships with a limited number of suppliers; Promote open communication among supplier's chain partners and Develop long-term strategic relationship orientation to achieve mutual gains. Chen et al (2004) states that strategic purchasing will lead to communications with suppliers, a limited number of suppliers and a way term orientation.

Chen at al (2004) proves all of those connections Significant. The conclusion to be drawn from this theory is that strategic purchasing arrangement can be an important link in the supply chain and contributes towards enhancing internal user department satisfactory and the overall financial results of a company. This study investigates on the effects of Eprocurement on the performance of County Governments in Kenya. The relevance of this theory in the study is based on the role of E-procurement on strategic purchasing. The study tried to establish whether strategic purchasing outcomes can be linked to E-procurement.

2.2.4. Purchasing effectiveness and purchasing efficiency theory

Van Woole (2005) presents two areas in which purchasing performance can be measured, purchasing effectiveness and purchasing efficiency.

The theory states that purchasing effectiveness is a measure of what has been accomplished and purchasing efficiency is a measure of what resources has been used to accomplish it. Based on Van Wools (2005) four dimensions, Cost/price, product/ quality, logistics and organization are determinants of efficiency and effectiveness. This study investigates the effects of E-Procurement on the performance of County Governments in Kenya. It tries to identify whether the determinants of efficiency and effectiveness in purchasing can be attributed to the adoption of E-procurement.

2.3. Empirical review

This refers to similar work done elsewhere. This section discusses the past empirical investigation similar to or related to this study.\

The empirical literature study on e-procurement and supply chain performance was the emphasis of this part. Electronic procurement has risen in popularity across the world as a result of technological advancements. In the United States, for example, a fast development in electronic procurement was recorded in early 2000, right before the recession. All government services were reported to be up and running at some stage throughout their procurement process by the end of the year, with some even engaging in online bids (Waithaka & Kimani, 2021). Vice President Dr. Mahamudu Bawumia announced the opening of Ghana's electronic procurement system, GHANEPS, on Tuesday, April 30th, 2019. Ghana was the first country in the West African sub-region to deploy an electronic procurement system for the public sector. The findings suggest that electronic procurement is

gaining traction in Ghana, with most private and governmental institutions using technology to improve electronic procurement.

Danso (2020) conducted a research entitled ‘’E-Procurement Impact In The Public Sector’’ The research design was descriptive. Both primary and secondary data was used. Purposive sample method was used to select 15 public sector organizations in Ghana for the study. Multiple linear regression was used to analyze the data. Findings revealed that, e-procurement leads to an effective E-tender evaluation (ETE), improves transparency in supply selection, improve procurement record management and effective supply relationships can be made easy. Based on the finding the study recommended that, Developing countries governments must invest heavily in eprocurement infrastructure to enable its usage in all sectors. And also procurement officers must also be trained well to enable its usage.

According to a study by Chegugu & Yusuf (2017) entitled The Effect of Electronic Procurement Practices on Organisational Performance in Public Hospitals in the Country, infrastructure costs per transaction increase with increasing transaction volume, based on a literature review of previous studies on the effects of e-procurement on business performance. Companies must build this critical mass through a value-added network of alliance partners and technological solution providers, according to Wanjera (2014), who also emphasized the construction of a financially viable e-invoicing solution. The use of an internet-based system to accomplish any or all of the processes in the procurement process, such as search, procurement, negotiating, ordering, receiving, and post-purchase verification, is referred to as e-procurement (Madzimure et al. 2020). The acquisition and sale of supplies, works, and services over the Internet and other information and network systems, including electronic data exchange and planning, is referred to as company-to-company, company-to-customer, and company-to-government electronic procurement. Muhia and Afande (2015) E-

procurement, according to Croom and Brandon-Jones (2005), is the use of internet-based integrated information and communication technology (ICT) to complete any or all steps of the procurement process, including search, procurement, negotiation, ordering, reception, and post-purchase verification. There are several types of e-procurement, each focusing on one or more parts of the procurement process, such as B. a Z-to-end system that integrates and simplifies multiple procurement activities across the organisation (Muhia & Afande, 2015). E-procurement is a lot more than just an online shopping cart. It's a complete platform that makes it easier, faster, and more cost-effective for businesses to identify their needs in a timely and cost-effective manner, in line with their goals and objectives.

And lastly e- procurement should be mandatory in all public sector procurements in the country Capen, et al (1971) conducted a study on the effects of effective e-procurement on firms. From their study, it came out that, e-procurement helps in decision-making process by keeping relevant information neatly organized and time-stamped. Most are template-driven which makes all transactions standardized.

E-procurement helps organisations streamline their whole purchasing process so they can focus on their core business operations and boost profitability in today's climate, which is defined by a focus on important strategic goals, quicker time-to-market, and more global competition. Internet technology is increasingly being used to purchase goods and services from a variety of known and unknown vendors, conduct e-learning where purchasing data is collected and distributed by internal and external parties, and e-market sites Enterprise Resource Planning (ERP.) is being expanded to be web-based in order to open up value chains. With connectivity with suppliers' supply chains and buyers' financial systems, buyers may access items and services from preferred suppliers, add shopping carts, generate requests and approvals, accept orders, and process bills (Jessop, 2006). Websites that offer e-

procurement allow qualified and registered users to search for buyers and sellers of products and services, as well as conduct transactions. Buyers and sellers can input expenses or make bids depending on the method. It is possible to start and finish transactions. Customers who make regular purchases may be eligible for volume discounts or special offers. Purchases and sales can be automated with e-procurement software. The participating firms anticipate better inventory control, buyer relief, and shorter manufacturing cycles. With the trend toward computerized supply chain management, e-procurement is likely to be incorporated into the larger purchase-to-pay (P2P) value chain. The Ghanaian government and the Public Procurement Act (PPA) recently published a statement urging all vendors to adopt the e-procurement system. The Vice President also mentioned that Ghana's public sector is fast evolving, especially in terms of technology use. The government will have to implement e-governance and, in particular, e-procurement. The national governments of Italy, New Zealand, Scotland, New South Wales, and Western Australia, according to a 2005 Commonwealth of Australia evaluation, are already employing an electronic procurement system for public procurement.

Waithaka and Kimani (2021) investigated the influence of e-procurement techniques on Kakamega county governments' efficiency frontier. The key results were that electronic procurement facilities were few within the Kakamega County Government, which might have an impact on procurement efficiency. In addition, the Kakamega County Government received a modest number of online orders for deliveries. Within the Kakamega county government, the availability and use of the e-procurement platform and e-ordering processes 22 has also been limited, which has harmed the procurement function's efficiency. The report suggests that procurement departments in local governments build a user-friendly information system that all suppliers, whether tech-savvy or not, can utilize. This will decrease prejudice in the use of e-procurement, and everyone will be able to contribute to

procurement staff skills. Wanianiet al. (2016) concluded that the Nzoia Sugar Company's existing technical infrastructure was adequate. A substantial majority of respondents (66.9%) agreed that the company's technical infrastructure is competent to facilitate e-procurement. Hardware and software, the Internet, and technological know-how were all covered. The technological infrastructure for e-procurement, according to 33.1 % of those polled, is insufficient. They put it down to the unreliable internet and a scarcity of scanners.

The findings support Lysons & Gilligham's (2003) contention that corporations have realized large profits by using an electronic integration system. Internet connectivity, insufficient network coverage, and system failures are the problems that the Nzoia Sugar Company faces when implementing e-procurement, according to the respondents, who also agreed that the company has already invested in the necessary ICT infrastructure to support e-procurement. They opposed using technologies other than e-mail for internal electronic communication in procurement matters, such as instant messaging and video conferencing, as well as suppliers having direct access to internal systems60, such as ERP systems, and the technological integration of the e-procurement system with other internal systems. The respondents ranked data and information security as the most critical factor in procurement. The technical infrastructure accounted for 11.38 percent of e-procurement utilization at the Nzoia Sugar Company. In an essay on the influence of e-procurement on company performance, Barasa et al. (2017) concluded that the government's provision of e-procurement support websites was inadequate, which may have hampered procurement efficiency. Furthermore, the government's ability to arrange delivery orders online has been limited. Furthermore, within the government, the availability and adoption of platforms and procedures for electronic procurement has been limited, lowering their efficiency in performing procurement tasks. The study indicated that there was a positive association between e-ordering and public

administration efficiency after utilizing regression analysis to examine the influence of e-ordering on public administration efficiency.

Keeping track of all bids means leveraging your knowledge to obtain better pricing. Companies can focus on their most lucrative trading partners and contracts. Well managed e-procurement helps reduce inventory level, increase efficiency and cost savings (faster and cheaper) in government procurement and improves transparency (to reduce corruption) in procurement services. Knowing product numbers, bid prices and contact points can help businesses close a deal while other suppliers are struggling to gather their relevant data.

EProcurement systems that allow multiple access levels and permissions help managers organize administrative users by roles, groups, or tasks. Procurement managers do not need to be as highly trained or paid because such systems are standardized and easy to learn. Empirical studies carried out by Gebauer et al (1988) in the United States of America indicated that the two most important measures for the success of procurement processes are cost and time. In this method, there is no paperwork, postage fee and other costs associated with preparation and sending tender documents. In their study, it was as well seen that, e-procurement activities is faster to send a document electronically as compared to the traditional method of sending tender documents through the post office.

It results in improved order tracking and tracing, for it is much easier to trace the orders and make necessary corrections in case an error is observed in the previous order. Secondly, there is reduction in time to source materials: Reduction in time has been proved as a relevant benefit by Witting, (2003), a study conducted to find out the benefits of technology in procurement. From the study, E-procurement was seen to be a rapid efficient method of finding and connecting new sources, being a lean channel for communication‖. A lot of time is spent on paper invoicing in terms of writing, filing and postal communication but while in

e-procurement, staff have sufficient time to engage in strategic issues of procurement the time wasted in moving from one town or country to another to look for a potential supplier or buyer is greatly reduced since with a click of a button,

You can readily get the information in the internet. By extension, Eprocurement leads to reduction in maverick buying. Maverick buying is when staff buys from suppliers than those with whom a purchasing agreement has been negotiated.

A study conducted by Puschmann (2005) in the UK on Electronic Procurement Management argued that, Eprocurement lowers administration costs: in his research, he stated that e procurement results in reduction in paperwork and this leads to lower administration costs.

Loughlin (2010) stated in his study that, technology in procurement helps in the reduction in procurement staff. Since much of the procurement process is done electronically, the number of staff needed to facilitate the process reduces. As noted in his study, the reduction in staff is an important way of producing competitive advantage through reduced costs. This is further supported by Lee et al (2000) in their study which revealed that through implementation of an eprocurement system, a steel supplier was able to carry out a multi-million-pound project with only 20% of the staff the company would normally have used. Koorn et al, (2001) stated in their study on impact of e-procurement activities in the manufacturing company. They found out that, eprocurement gives an organization competitive advantage over its competitors. As a centralized department can oversee all procurement activities and different offices worldwide can access the same documentation when required, this gives a distinct advantage over the much slower process of having to post documentation between offices. This extends the supply chain beyond geographical boundaries to a much wider group. Suppliers can be monitored on timely delivery, quality delivery of products and services hence performing suppliers can be contacted in future. This raises other logistical

considerations which may impact on scheme quality (Koorn et al, 2001). This implies that with e-procurement, every prospective supplier and buyer is always accessible to his/her convenience.

The result is not only greater market access but also increased productivity Another benefit of e-procurement is improvement of communication as defined clearly by Koorn *et al* (2001).

They stated categorically in their study that, e-procurement allows sections of electronic documentation to flow through the supply chain; it improves the speed of returns and subcontractor price visibility. They further noted that since it is easier to communicate requirements in a quicker more accessible manner, it will result in a better understanding of requirements and due compliance besides allowing clients to gauge the state of the market by seeing how much interest is shown in the tender. Birks et al, (2001) considered market intelligence and the decisions made on that intelligence as two separate drivers. They however state that since reliable procurement decisions cannot be made without market intelligence and each is reliant on the other for the purpose of this study these two are considered together as ―Improved Market Intelligence and Enhanced Decision making‖. A reduced Operating and Inventory cost is also another benefit of e-procurement: This is from the fact that much if not all paperwork is eliminated. Postage costs are also not incurred, among other expenses associated with sending and receiving documents when sending them by post.

Empirical evidence supports the fact that e-procurement impacts on the activities of an organization. Gunasekaran and Ngai (2008) concluded in their study that e-procurement makes purchasing activities more effective in terms of time and cost hence, it has changed the way businesses are conducted in terms of purchasing of goods. Other scholars like Sanders (2007) affirms that procurement impacts on performance both directly and

indirectly. Quesada, Gonzalez, Muller and Mueller (2010) added that e-procurement improves procurement performance significantly. This indicates that e-procurement is of significance to the organization in that it affects their operations directly or indirectly.

Others stated that e-procurement promotes cost savings and increased effectiveness in an organization despite the size of the firm (Gunasekaran et al., 2009).

Cost savings in procurement over time is very crucial to the firm and arguments made by several studies conducted in the area of e-procurement conclude that e-procurement indeed contributes to cost savings or efficiency in transaction and competitive sourcing opportunities (Subramaniam and Shaw, 2014; Angeles and Nath, 2007; Croom and Brandon-Jones, 2005; Croom and Brandon-Jones, 2007).

Muhia and afande., 2015 conducted a study , This study explored how electronic procurement and performance of organizations. The study concluded that electronic procurement and performance of organizations was indeed related and it was recommended that all procurement systems be made mandatory and that the procurement teams be well trained on all systems used to ensure efficiency is achieved through use of e-procurement. The researcher suggested that further studies be conducted.

Kituzi (2016) conducted a research on influence of e-procurement on organizational performance: the case of Kenya. The research concludes that a majority of the manufacturers in Nairobi, Kenya have adopted e-procurement strategy to improve organizational performance. The findings indicate that there is a significant positive relationship between the components of e-procurement namely; data transmission, buyer/supplier collaboration, systems management and billing management of the e-procurement process with the organizational performance of manufacturing firms in Nairobi County Kenya. The study

recommends that manufacturing firms in Nairobi need to incorporate all the e-procurement components into the system to enable them to improve the overall performance of their firms.

The study also recommends that future research will need to be carried in other industries and countries in order to show if the link between e-procurement components and organizational performance.

2.4. Conceptual Framework

In order to solve the problem of this study, the conceptual framework followed in this way. The factors like E-Bidding, E-Evaluation and E-Contract was independent variable while improvement of Public procurement procedures determined by timely tender publication, timely evaluation of bids, successful contract execution, effective contract management and transparency as dependent variable.

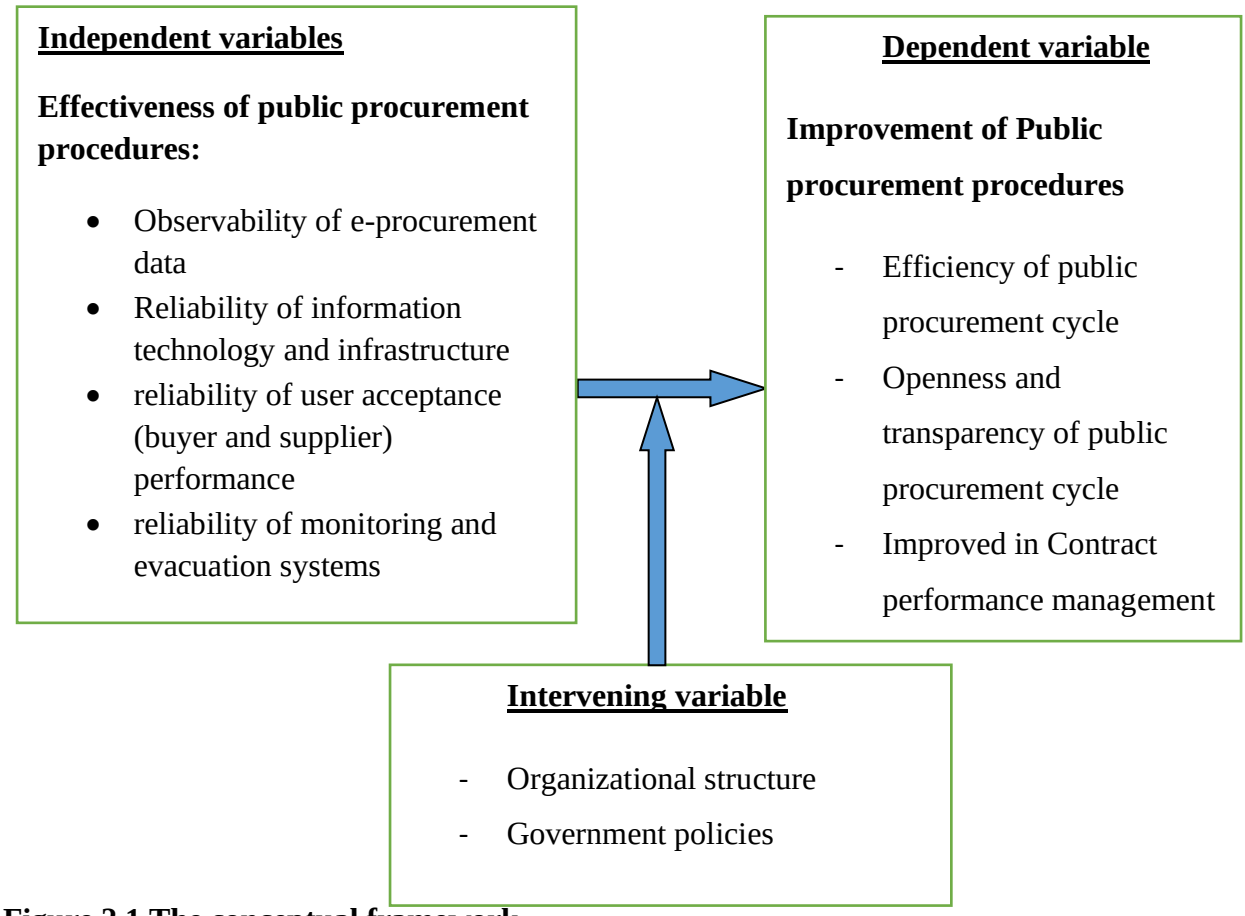

Figure 2.1 The conceptual framework

Source: *Researcher conceptualization, (2023)*

2.5. Research Gap

There is no study among of the mentioned above which uses the conceptual model as shown in my book figure 2.1, and there is no study that was addressed in the procurement project by evaluating the impact of E-procurement system on improvement of public procurement procedures in Northern Province of Rwanda, and they did not examine the contribution of E-bidding, E-Evaluation and E-contract on public procurement procedures in general.

For that this motivates the researcher to cover those gaps by assessing the impact of E-procurement system on improvement of public procurement procedures in Northern Province of Rwanda, and according to world 'banks report it is shows that there was no research that has been conducted on impact of e-procurement that has been introduced by government of Rwanda. (World bank group,2017)

CHAPTER 3: RESEARCH METHODOLOGY

Introduction

This chapter presents the research design, target population, sample size, and sampling techniques. The instruments of data collection are questionnaire, observation, and documentary techniques. Source of data was primary and secondary data, data processing and analysis methods also showed in this study.

3.1. Research Design

During this study, the researcher applied qualitative and quantitative approaches. It is quantitative approach where examining the effectiveness of E-bidding on improvement of Public procurement procedures in Rwanda, the contribution of E-Evaluation on improvement of Public procurement procedures in Rwanda and the contribution of E-contract on improvement of Public procurement procedures in Northern Province of Rwanda. The study used the correlational to assess the relationship between E-bidding, E-Evaluation and E-contract on improvement of Public procurement procedures using statistical packages for social sciences (SPSS) version 20.0.

3.2. Study Population and Sample size

The population is defined as the total collection of elements about which wish to make a sum. A population is a body of people or any collection of items under consideration from which samples are taken for measurement (Jill and Roger, 2013).

In this study, target population is 142 employees of five District of Northern Province of Rwanda who dealing day to day with procurement procedures.

Sample Size

A sampling refers to the number of items to be selected from the population. A sample is a smaller set of values selected from the population, reflecting its characteristics. In this study, sample size selected from target population. This study uses 5% of margin errors and confidentiality level is 95%. The study applied the formula of Taro Yamane (1982) to determine sample size of the study.

$$n = \frac{N}{1 + N * (e^2)}$$ **n =** sample size **N=** Total population **e=** margin error

$$n = \frac{142}{1 + (142 * 0.05^2)} = 104.79 \approx 105$$

3.2.1. Respondent profile

The sample of respondents is one hundred and five (105) composed by Procurement officers, members of tender committee and Internal Auditors of five Districts and five District Hospitals, Legal Advisors, Director of Finance, Corporate Service Division Managers and Executive Secretaries of five districts of Northern Province of Rwanda as shown in table below:

Table 3.1: Sample size

SN	Job position	Number	Institution
1	Procurement Officer	10	Five Districts/NP
2	Procurement Officer	5	Five District Hospitals/NP
3	Members of tender committee	25	Five Districts/NP
4	Members of tender committee	25	Five District Hospitals/NP
5	Internal auditors	15	Five Districts/NP
6	Internal auditors	5	Five District Hospitals/NP
7	Legal advisor	5	Five Districts/NP
8	Director of finance	5	Five Districts/NP
9	Corporate service Division manager	5	Five Districts/NP
10	District executive secretary	5	Five Districts/NP
TOTAL.		105	

3.3. Sampling procedure

This study applied the purposive sampling technique to select the respondents from target population by picking only those which meet with the purpose of this study using the researcher own judgement.

3.4. Sources of data

Data are either classified as primary or secondary. During data collection, this research considered to get accurate the results and reliably generalizable findings.

3.4.1. Primary data

Primary data comes from the people you are searching from and are therefore the most direct kinds of information that you can collect. Primary data is the first-hand observation and investigation. The questionnaires form the basis of primary data where data collected from this source focus on the background features of respondents and their knowledge on impact of E-procurement system on improvement of Public procurement procedures in of Rwanda.

3.4.2. Secondary data

Secondary data are data that have already been collected for some purpose other than the questions at hand. Secondary data are one step moved from the original data and are often an examination of a study someone else has made on a Subject or an evaluation of commentary on or summary of primary material. This technique reveals the literature and tries to convey both global and national perspectives so that the researcher could have a comparative analysis. In the case of secondary data, information needed is from the annual reports on procurement plan execution from Five Districts of Northern Province.

3.5. Data Collection Instruments

It consisted in various instruments that used by the researcher for gathering information from respondents.

3.5.1.Questionnaire

The instruments consist of the series of questions and other prompts for the purpose of gathering information from respondents. In this research, the questionnaire distributed to 109 respondents from selected Districts who dealing day to day with procurement procedures, and it composed by close end and open end questions where researcher expects the participation rate of 100% for responding the questions.

3.5.2.Key-Informant-Interview

It consisted with asking the questions with the proper voice on the purpose of exchanging ideas between the interviews and the interviewee. During this study, the interview addressed to beneficiaries of E-procurement system.

3.5.3. Documentary

Documentary technique used by the researcher to obtain the information about a phenomenon where the researcher wishes to study. In this study, the documents targeted are the available laws, ministerial order and reports related to Public procurement procedures in Northern Province of Rwanda.

3.6. Measurement of variables

Variables are measurement using an instrument, device, or computer. The scale of the variable measured drastically affects the type of analytical techniques that can be used on the

data, and what conclusions can be drawn from the data. There are four scales of measurement, nominal, ordinal, and interval. In respect of this study, there are typically three levels of measurement that are nominal, ordinal and interval.

3.7. Validity

Content validity cannot be determined statistically, but rather by experts with reference to experience and literature. (Nunnally j. c.,1978). the items used to measure user-perceived e-procurement quality draw on information systems and internal service literature. In addition, the survey was pilot tested by academic experts and practitioners with experience of e-procurement provision.

In order for the findings to be statistically valid and representative, the sample size of the study must be proportional to its objectives. It must be "big enough" for a scientifically and statistically significant effect to exist. In order for the findings of this study to be valid and generalizable to the entire population, the sample design was based on empirically proven formulas and random techniques (Wellman, 2020). In order to assure the validity and reliability of this study's findings, a pilot study was to be conducted in order to assess the questionnaire beforehand. This helped to determine if questions are posed in a way that respects cultural norms and if all questions are understandable in the way that the researchers want them to be understood, allowing for any modifications to be made before the actual study is conducted.

N is the total number of respondent pairs

A: expected credible answers

B: expected errors

Content validity index = N=A/B=10/14=0.7

The questionnaire is valid because the content validity index is greater than 0.6.

Validity refers to the question of whether the findings are truly what they appear to be. Thus, validity is strongly associated with a study's credibility. It also refers to the extent to which the results of a study provide the correct answer to the research question. Wellman (2002) defines validity as the extent to which an instrument measures what it claims to measure. Content validity refers to the extent to which an instrument comprehensively evaluates or measures the construct of interest. The questionnaire meticulously crafted and piloted with a small sample of the population in order to make further enhancements. This done to enhance the validity and precision of the study's data collection.

3.8. Reliability

Reliability concerns the consistency of a measure. That is, the tendency to obtain the same results if the measure is to be repeated by using the same subjects under the same conditions. There are two general approaches to establish the reliability of a questionnaire where the first is to ask the questions again in a different part of the questionnaire in the same or slightly altered form, but in such a way as to yield the same information. This is a consistency check, but does not take into account variations in day-to-day variations. A second better approach, called test and re-test as to re-administer the questionnaire to the same group or individuals several days later and to compare the results. For this study, the questionnaire was given to different groups of respondents.

Table 3.2: Reliability Statistics

Cronbach's Alpha	N of Items
.793	14

The calculation of Cronbach's alpha performed using the Statistical Package for the Social Sciences (SPSS) in order to assess the reliability of the research instrument. It is accepted that a dependability coefficient falling within the range of 0.7 to 1.0 is generally considered to be satisfactory. In the context of this analysis, Cronbach's alpha was 0.793 and it is considered statistically significant to have an alpha coefficient of 0.7 or higher

3.9. Data processing, analysis and presentation

3.9.1. Data processing

It is concerning to put the responses into meaningful categories where it consisted of editing, coding, recording, classifying and making the tables.

i. Editing: is focusing to the process of going through questionnaire to ensure that the errors and omission are corrected. Editing involves the inspection and if necessary, connections of each questionnaire or observation form; the basic purpose of editing is to impose some minimum quality standards on the raw data.

ii. Tabulation: refers to the orderly arrangement of data in a table other summary format achieve by counting the frequency or responses to each question. Tabulation involves putting data into statistical tables and determination of frequency of the responses to a particular question and their percentages. For this research, tabulation is used to summarize the data collected using different techniques into table format of frequencies and percentage.

3.9.2. Data analysis

In data analysis T-tests analysis used; T-tests indicate that, in the vast majority of cases, there is no significant difference between variables for groups with missing and non-missing Y values.

Before our research aim to establish the impact of e-procurement on improvement researcher corrected 2 paired samples. In our research t-test one paired group used.

T-test used to analyze whether there is a relationship between means score from respondents (before and after introduction of e-procurement system)

3.9.3. Hypothesis testing under t-test statistics

There are two kinds of hypotheses for a one sample t-test, the null hypothesis and the alternative hypothesis. The alternative hypothesis assumes that some difference exists between the true mean (μ) and the comparison value (m0), whereas the null hypothesis assumes that no difference exists.

Formula

Type	T-statistic	Degrees of freedom
One-sample t-test	$t = \frac{\overline{x} - \mu_0}{s/\sqrt{n}}$	df = n – 1
Paired t-test	$t = \frac{\overline{X}_D - \mu_0}{s_D/\sqrt{n}}.$	df = n – 1

449 × 220

3.9.4. Data analysis procedure

The methods used to analyze the data of this research are qualitative and quantitative methods. Qualitative method used to show data from interview results. SPSS used as software for analysis where quantitative method was describing impact of E-procurement system on improvement of Public procurement procedures in Northern Province of Rwanda.

It is in that case descriptive statistical used such as frequency, percentages, and cumulative percentage. The study used t-test analysis to determine the relationship impact of E-procurement on public procurement procedures in Rwanda.

3.9. Anticipated limitations/challenges of the study

The researcher is expecting to encounter problems during the period of this research: These problems faced are some respondents could provide the false answers to the questionnaire where it causes to cancel some answers; the language problems for some respondents are supposed to be appearing at the field of this research while collecting data, time constraint and another problem is to obtain the secondary data could be difficult. The ways to overcome these limitations are to avoid false information and language problems, a researcher assisted the respondents where they faced the challenges in responding the questionnaire.

3.10. Ethical Considerations

To ensure confidentiality of the information provided by the respondents and to ascertain the practice of ethics in this study, the following activities implemented by the researcher: the respondents coded instead of reflecting the names. Researcher sought the permission through a written request to the concerned officials of the study areas, and requesting the respondents to sign in the informed consent form, acknowledge the authors quoted in this study and the author of the standardized instruments through citations and referencing. The research presented the findings in a generalized manner.

CHAPTER 4 : DATA ANALYSIS, AND INTERPRETATION OF FINDINGS

Introduction

In this chapter the researcher has analyzed the data collected and discussed based on effect of e-procurement system on performance of public procurement procedures in Districts in Northern Province in Rwanda. In this research, descriptive statistic for analyzing the data obtained from respondent and tables were used to make interpretation. The respondents were 105 employees and they included Procurement officers, members of tender committee and Internal Auditors of five Districts and five District Hospitals, Legal Advisors, Director of Finance, Corporate Service Division Managers and Executive Secretaries of five districts of Districts in Northern Province of Rwanda. All answers received from questionnaire were analyzed during the research process.

4.1. Demographic characteristics of the respondents

Under this case the research looks on the profile of respondents based on the, sex, age group, education, and experience.

4.1.1. Sex and age of the respondents

The respondents were required to indicate their sex. The respondents were required to indicate their age to see if they were mature enough to provide useful information. Table 4.1 indicates the sex and age of the respondents that participated in this study.

Table 4.1 Sex and age of respondents

Sex	**Frequency**	**Percentage**
Male	59	56.1%
Female	46	43.9%
Total	**105**	**100.0%**
Age group	**Frequency**	**Percentage**
21-30 years	12	11.4%
31-40 years	47	44.7%
41years and above	46	43.9%
Total	**105**	**100.0%**

Source: Primary data, June 2023

Table 4.1 indicates that 56.1% respondents are male while 43.9% are female. There are more male than female working in public procurement in Districts in Northern Province. Table 4.1 shows us that 11.4% are aged between 21 and 30 years old, 44.7% had the age between 31-40 years old, and 43.9% of respondents had the age of 41years and above. The result indicates that the big number of respondents had the age between 30-39 years old. By implication, majority of the respondents being mature enough to generate the information to this study.

4.1.2. Education level and experience of respondents

The respondents were required to indicate their education level. This was to discover how long employees have worked in public procurement in Districts in Northern Province. For the more one stays, the more experience gained and with more information for the research. The respondents are required to indicate their working experience together. Table 4.2 indicates the education and experience of the respondents that participated in this study.

Table 4.2 Education level and experience of respondents

Academic qualification	**Frequency**	**Percentage**
Secondary	0	0.0%
Bachelor	74	70.4%
Masters	31	34.6%
Total	**105**	**100.0%**
Working years	**Frequency**	**Percentage**
Less than 5 years	18	17.1%
5-20 years	65	68.2%
21 years and above	22	19.7%
Total	**105**	**100.0%**

Source: Primary data, June 2023

Table 4.2 shows that 70.3% of respondents have Bachelor's degree, while 34.6% of respondents have master's degree. This is a clear indication that most of the employees working in public procurement in Districts in Northern Province have Bachelor's Degree. Table 4.2 indicates that 17.1% of the total respondents are less than 5 years of working experience, 68.2% of the total respondents are experienced between 5 and 20 years of working and 19.7% of the remaining respondents are experienced of 21years and above. This is a clear indication that the majority of those who participated in the study have the working experience between 5 and 20 years and this means the working environment in public procurement in Districts in Northern Province is conducive since employees are maintained and retained.

4.2. The effectiveness of e-procurement

This part assesses the overall respondent's response on the effectiveness of E-procurement, it. it reflects on respondent views on the observability of e procurement data, the reliability of information.

4.2.1. Reliability of the E-procurement

The reliability can be defined as the quality of being trustworthy or of performing consistently well. This session aim to assess whether E-procurement is effective in in terms of reliability.

Table 4.3: Reliability of the system

		Frequency	Percent
Valid	Strongly Agree	35	33.3%
	Agree	50	47.6%
	Neutral	12	11.4%
	Disagree	8	7.6%
	Strongly Disagree	0	0.0%
	Total	105	100.0%

Source: Primary data, June 2023

The above table shows the respondents view towards trustworthiness of e -procurement system placing management procurement related tasks, the 33.3% of the total respondents strongly agree that e procurement system is reliable, 47.6% of the total respondent agree that the system is reliable , 11.4% of the total respondent were neutral, while none voted against the reliability of e procurement. This implies that displayed information within E-procurement system are clear.

4.2.2.Observability and monitoring of e-procurement systems

In distributed systems, observability is the ability to collect data about programs' execution, modules' internal states, and the communication among components. Researchers say that system is that a system is considered "observable" if the current state can be estimated using only the information from the results, that is, the sensor data this part assess whether E-procurement is reliable in terms of observability and management of E-procurement data.

Table 4.4: Observability of e-procurement data

		Frequency	Percent
Valid	Strongly Agree	42	40.0%
	Agree	56	53.3%
	Neutral	0	0.0%
	Disagree	7	6.67%
	Strongly Disagree	0	0.0%
	Total	105	100.0%

Source: Primary data, June 2023

The above Table shows staff view on the observability of e _procurement system, according to the research results 40% of the total respondents have reported that the system is highly observable, 53.3% of the total respondent agreed that the E-procurement is highly observable when it comes to data collection and data estimation , while 6.6% strongly disagree that the system is rigid on some of the aspects . based on the results the majority of the report have report that the system is highly observable.

4.2.3. Accurateness and accessibility of the system

Accuracy can be defined as the ability of the instrument to measure the accurate results of the system. In other words, it is the closeness of the measured value to a standard or true value. While accessibility he accessibility of a E procurement system to the users, regardless of their physical location and time

Table 4.5: Accurateness and accessibility of the system

		Frequency	Percent
Valid	Strongly Agree	28	26.6%
	Agree	50	47.6%
	Neutral	21	20.0%
	Disagree	6	5.7%
	Strongly Disagree	0	0.0%
	Total	105	100.0%

Source: Primary data, June 2023

The table 4.5; show respondent view on the accurateness the system, 26.6% of total respondent they have strongly agree that system is accurate and it is accessible, while 47.6% agree that E procurement system is accurate and accessible, 5.7 % disagree of the respondent were neutral while 20 % of the total respondents strongly disagree the accurateness of the system. This implies that system is accurate. However, the 20% of respondents who didn't indicate their responsive is higher number.

Some of the respondent reported that ‘*’ in fact that key information (cost center, commodity codes,etc.) is hard coded against the user dramatically reduces coding errors and provides highly detailed and easily accessible data. This is essential to maximize the financial benefits*

of strategic sourcing. A successful e-procurement implementation provides high quality, detailed management information and l negate the need for data warehousing or resource-heavy data mining''

4.2.3. Timeliness of the E-procurement system

The fact or quality of being done or occurring at a favorable or useful time. This part aim to assess if the Procurement offer the results or outcome on time

Table 4.6: Timeliness of the system

		Frequency	Percent
Valid	Strongly Agree	45	43%
	Agree	50	48%
	Neutral	0	0%
	Disagree	5	5%
	Strongly Disagree	5	5%
	Total	105	100.0

Source: Primary data, June 2023

The table 4.6 shows respondent views on the time it takes process a purchasing order or to add a tender by using E-procurement system according to the research results 43% of the respondents strongly agree that E-procurement doesn't require a lot of time to place order tender while 48 % agree that system is time effective, none of total respondent were neutral, while 5% disagree the timeliness of the systems, and 5% strongly disagree. Given the majority of respondent strongly agree that e-procurement is time effective researchers can conclude that the system is effective.

Some of the respondent reported that ‘’ *E-procurement enables the purchase-topay process online. A typical example uses a Web-based transacting tool whereby items are selected predominantly from pre-sourced catalogs and submitted for electronic approval. This tool is then linked to the back-end ERP system for entry, payment of invoices, and collation of management information. Electronic processing (including the automation of p-card purchasing) leads to great time savings and efficiency’’*

4.3. Effect of E-procurement system on performance of Public procurement procedures in Districts in Northern Province of Rwanda

This part contains the summary of the respondents' views on effect of E-procurement system on performance of public procurement procedures in Districts in Northern Province of Rwanda related questions answered.

4.3.1. Impact of E-bidding on the improvement of public procedures

Electronic Bidding means a method of issuing Solicitations and/or receiving written Bids on the Bidding System where the process of issuing and/or receiving Bids by email, or online is considered. This part aim to assess its contribution on the improvement of public procedures.

Table 4.7: Effectiveness of e-bidding in public procurement cycle

Statements	Mean	SD
E-bidding rules and procedures are simple, clear and ensure access to procurement opportunities	3.56	.43
E-bidding promoted competition via public procurement procedures	3.46	.57
E-bidding facilitated the means of advertisement of tender.	3.49	.42
Overall Mean	**3.50**	

Source: Primary data, June 2023

Table 4.7 shows the effectiveness of e-bidding in public procurement cycle and the findings are represented as follows:

The statement asked whether e-bidding rules and procedures are simple, clear and ensure access to procurement opportunities and was perceived with the mean of 3.56 (strong) and standard deviation of 0.43 (homogeneous). This result showed that respondents were strongly agreed that Districts in Northern Province use e-bidding rules and procedures which are simple, clear and ensure access to procurement opportunities are and the respondents have the similar understanding on this statement.

The following statement implies that the respondents agreed with different opinions that Districts in Northern Province 's e-bidding promoted competition via public procurement procedures and it was perceived by the mean of 3.46 (tend to strong) and the standard deviation of 0.57 (heterogeneous).

For the next statement, respondents agreed with similar perceptions that and e-bidding facilitated the means of advertisement of tender and it was perceived by the mean of 3.49 (tend to strong) and the standard deviation of 0.42 (homogeneous).

In general, all items assessed have scored with the aggregate mean of 3.50 (strong) which means that the employees of Districts in Northern Province agreed that e-bidding in public procurement cycle is effective.

4.3.2. Contribution of e-evaluation on improvement of Public procurement procedures in Districts in Northern Province of Rwanda

Electronic assessment, also known as digital assessment, e-assessment, online assessment or computer-based assessment, is the use of information technology in assessment such in procurements. This part contains the summary of the respondents' views on the Ccontribution of e-evaluation on improvement of public procurement procedures in Districts in Northern Province of Rwanda related questions were answered.

Table 4.8: E-evaluation on improvement of Public procurement

Statements	**Mean**	**SD**
E-evaluation increased transparency of public procurement information	3.68	.27
Due to e-evaluation the Level of unsuccessful public procurement processes decreased	3.87	.11
By e-evaluation the notification of tender award become easy	3.29	.52
Overall Mean	**3.62**	

Source: Primary data, June 2023

The question that analyzed if there was E-evaluation increased transparency of public procurement information was perceived with the mean of 3.68 (strong) and standard deviation of 0.27 (homogeneous). These results showed that respondents strongly agreed and they have similar understanding in answering this question.

The following statement implies that the respondents strongly agreed with common opinions that due to e-evaluation, the level of unsuccessful public procurement processes decreased and it was perceived by the mean of 3.87 (strong) and the standard deviation of 0.11 (homogeneous). For the next statement, respondents agreed with different perceptions that e-evaluation favor the notification of tender award become easy in Districts of Districts in Northern Province of Rwanda and it was perceived by the mean of 3.29 (tend to strong) and the standard deviation of 0.52 (heterogeneous).

In general, all items assessed have scored with the aggregate mean of 3.62 (strong) which means that the employees of Districts in Northern Province in Rwanda agreed on the contribution of e-evaluation on performance of Public procurement procedures.

4.3.3. The contribution of e-contract on improvement of public procurement procedures in procurement in Districts in Northern Province of Rwanda

An electronic contract (e-contract) is simply a contract created using electronic means. Like physical contracts, e-contracts have three components: Offer. The set of terms and conditions presented by the party that drafted the contract. Acceptance This part contains the summary of the respondents' views on the analyzing the contribution of e-contract in contract performance management in public procurement in Districts in Northern Province of Rwanda related questions were answered.

Table 4.9: E-contract and performance of public procurement procedures

Statements	Mean	SD
By e-contract the suppliers are delivering the right thing at the right time	2.47	.63
By e-contract communication of issues related to contract become easy	3.56	.48
E-contract platform enables the safekeeping of performance security	3.8	0.12
Overall Mean	**3.30**	

Source: Primary data, June 2023

The respondents disagreed that by e-contract the suppliers are delivering the right thing at the right time and was perceived with tend to weak mean of 2.47 (tend to weak) and standard deviation of 0.63 (heterogeneous). These results showed that respondents have dissimilar understanding in answering this question.

The following statement implies that the respondents strongly agreed with the same perceptions that by e-contract communication of issues related to contract become easy and it was perceived by the mean of 3.56 (strong) and the standard deviation of 0.48(homogeneous). Also the respondents strongly agreed that e-contract platform enables the safekeeping of performance security and it was perceived by the mean of 3.8 (strong) and the standard deviation of 0.12 (homogeneous). In general, all items assessed have scored with the aggregate mean of 3.03 (tend to strong) which means that the employees of Districts in Northern Province in Rwanda agreed that e-contract contribute on performance of public procurement procedures in procurement in Districts in Northern Province of Rwanda

4.3.4. Comparison of performance of procurement procedures and manual procurement after introduction of e-procurement in Districts in Northern Province of Rwanda

This part contains the summary of the respondents' views on the analyzing the comparison of performance of procurement procedures and manual procurement after introduction of e-procurement in Districts in Northern Province in Rwanda related questions were answered.

Table 4.10: Performance of procurement procedures and manual procurement

Statement	Mean	SD
Efficiency of the public procurement cycle of your District after introduction of e-procurement	3.58	.48
Openness and transparency of the public procurement of your District after introduction of e-procurement	3.59	.43
Contract performance management of public procurement of your District after introduction of e-procurement	3.6	.32
Efficiency in terms of time saving of procurement office of your District after introduction of e-procurement	3.7	.4.7
Increase in volume of bidders per tender at your District After introduction of e-procurement	3.61	.0.32
Overall Mean	**3.61**	

Source: Primary data, June 2023

The respondent agreed that there is efficiency of the public procurement cycle in their district after introduction of e-procurement and was perceived with an aggregate mean of 3.58 (strong) and standard deviation of 0.48 (homogeneous). These results showed that respondents have similar understanding in answering this question.

The respondents also agreed that there is openness and transparency of the public procurement in their District after introduction of e-procurement and were perceived with an aggregate mean of 3.59 (strong) and standard deviation of 0.43 (homogeneous). These results showed that respondents have similar understanding in answering this question.

The respondent also agreed that there is contract performance management of public procurement of their after introduction of e-procurement and was perceived with an aggregate mean of 3.6 (strong) and standard deviation of 0.32 (homogeneous). These results showed that respondents have similar understanding in answering this question.

The respondent also agreed that there is efficiency in terms of time saving of procurement office of their District after the introduction of e-procurement and was perceived with an aggregate mean of 3.7 (strong) and standard deviation of 0.47 (homogeneous). These results showed that respondents have similar understanding in answering this question.

Finally , the respondents agreed that there is increase in volume of bidders per tender at their District after introduction of e-procurement and was perceived with an aggregate mean of 3.61 (strong) and standard deviation of 0.32 (homogeneous). These results showed that respondents have similar understanding in answering this question.

4.4. Hypothesis testing (T-test analysis)

This part aim to test research hypothesis by measuring if there is significant statistical impact of E- procurement on the improvement of public procurement procedures in Rwanda. Whereby the T-test was used to measure respondent' opinion on the use of existed manual system and the current system known as E – procurement

Table 4.11: Efficiency of public cycle before and after E-procurement

	E-procurement	*Manual Proc*
Mean	4.2	2.157
Variance	0.417021	0.7088
Observations	105	95
Pearson Correlation	0.743533	
Hypothesized Mean Difference	0	
Df	104	
t Stat	35.331	
P(T<=t) one-tail	2.2706	
t Critical one-tail	1.661	
P(T<=t) two-tail	4.54E+00	
t Critical two-tail	1.985	

Source: Primary data, June 2023

The procurement cycle is the process of selecting a vendor, buying goods or services from them and managing their ongoing performance. The table above presents the respondents view on the role of E-procurement on efficiency of public procurement cycle. based on the data the respondents rating on the efficiency of existed manual system is 2.1578947 mean score , which is below average score of 2.5 this indicate that the manual system was not time friendly while the respondents mean score on E-procurement towards efficiency of procurement cycle was reached at 4.2 which indicate a strong mean score.

Hypothesis testing

In order to test our hypothesis (df)=104, p-value =1.985 (critical two tails was used) the significant level is between 0.05 above (p≥ᾱ), this implies that there is statistically significant difference between meansof two sample @ 0.001Comparison on level of openness and transparency of public procurement cycle

Table 4.12: Level of openness and transparency of public procurement cycle

		E-procurement	*Manuel proc*
Mean	4.252632		2.126316
Variance	0.446137		0.771109
Observations	105		95
Pearson Correlation	0.597969		
Hypothesized Mean Difference	0		
Df	104		
t Stat	28.85714		
P(T<=t) one-tail	8.43E-49		
t Critical one-tail	1.661226		
P(T<=t) two-tail	1.69E-48		
t Critical two-tail	1.985523		

Source: Primary data, June 2023

The above summarizes respondent rating on manual and E-procurement , according to the ratings the mean score of manual system is 2.126316 is weak while the E-procurement system was rated at 4.25263157 as mean score, which indicate strong mean.

Hypothesis testing

By testing hypothesis the the p-value from tailed sample mean and two tail has been used, degreeof freedom (df)=104, and p-value(P)=1.98 and 1.66 ~two tail,one tail. The student statistical table that significant level is above 0.05 ($p \geq 0.05$). thus, implies that there is statistical difference between two sample means.

Table 4.13: Online Vs offline tenders for the FY 2020-2021

Description	**Value (Frw)**	**Numbers**	**% in Value**
Total online tenders	380,694,594, 260	5328	82.03%
Total offline tenders	83, 425, 459,639	453	17.97%
Total tenders	**464,120, 053,899**	**5781**	**100%**

Source: Secondary data, Elaborated from RSSP annual report, 2021

The above table presents, status of offline and online tenders, according to the results, 5328 tenders worth of 380,694,594, 260 Rwf were processed online. While 453 worth 83, 425, 459,639 were proceed offline. This implies that E-procurement is effectively used in public procurement since majority (82%) of tenders were proceed via online

Table 4.14: Figures of online procurement contracts awarded in the FY 2020-2021

No	Procurement categories	Number		%
		All contracts awarded and signed with the bidders	all contracts suspended during contract execution	
1	Procurement for Goods or Supplies	**2412**	**1**	**0.004**
3	Procurement for works	**278**	**2**	**0.72**
4	Procurement for consultancy services	**705**	**0**	**0.00**
5	procurement for non-consultancy services	**1933**	**1**	**0.005**
Total		**5328**	**4**	

Source: Secondary data, Elaborated from RSSP annual report

The above table summarize the number of contracts that were awarded and rejected via online, according to the results the only slight number of contract were rejected via online tendering, this indicates how E-procurement system is effective in screening the applicants information . and this shows the reliability of the system

CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS

Introduction

This chapter discusses the findings of the study, the summary, conclusions, and recommendations in relation to the study objectives. The discussion explains the findings of the study in support or in contrast to the literature after which the summary, conclusions, and recommendations are drawn.

5.1. Summary

The overall objective of this study was to study the effect of e-procurement system on performance of public procurement procedures in Districts in Northern Province in Rwanda. Literatures in relation to the topic were full reviewed in order to get a deep understanding of concepts and theories of e-procurement system on performance of public procurement procedures. Empirical studies were also reviewed in order to explore the findings of previous researchers on related cases.

The target population of this study was 142 employees of Districts in Northern Province attached to the use of e-procurement. The questionnaire was the main tool for data collection. After collecting data, the tasks of editing, coding, and gathering was followed by using SPSS. After all requirements for analysis, the results were found to be the following:

After analyzed the data from the finding implies that e-procurement system has an effect on performance of public procurement procedures in Districts in Northern Province in Rwanda .

Findings on “Effect of E-bidding on performance of Public procurement procedures in Districts in Northern Province of Rwanda”, The researcher found that there was a positive effect of e-bidding in public procurement cycle.The respondents have strongly agreed that

Districts in Northern Province uses e-bidding rules and procedures which are simple, clear and ensure access to procurement opportunities, e-bidding facilitated the means of advertisement . In general, all items assessed have scored with the aggregate mean of 3.50 (strong) which means that the employees of Districts in Northern Province agreed that e-bidding in public procurement cycle is effective.

Findings on "Contribution of e-evaluation on performance of Public procurement procedures in Districts in Northern Province of Rwanda" , The researcher found that there is a clear contribution of e-evaluation on performance of Public procurement procedures in Districts in Northern Province of Rwanda. The respondents confirmed that E-evaluation increased transparency of public procurement information. They also strongly agreed with common opinions that due to e-evaluation, the level of unsuccessful public procurement processes decreased. In general, all items assessed have scored with the aggregate mean of 3.62 (strong) which means that the employees of Districts in Northern Province in Rwanda agreed on the contribution of e-evaluation on performance of Public procurement procedures.

Findings on "Contribution of e-contract on performance of public procurement procedures in Districts in Northern Province of Rwanda", The researcher found that at different levels there is a contribution of e-contract on performance of public procurement procedures in Districts in Northern Province of Rwanda. The respondents disagreed that by e-contract the suppliers are delivering the right thing at the right time.

However they strongly agreed with the same perceptions that by e-contract communication of issues related to contract become easy and it was perceived by the mean of 3.56 (strong) and the standard deviation of 0.48(homogeneous). Also the respondents strongly agreed that e-contract platform enables the safekeeping of performance security. In general, all items assessed have scored with the aggregate mean of 3.03 (tend to strong) which means that the

employees of Districts in Northern Province in Rwanda agreed that e-contract contribute on performance of public procurement procedures in procurement in Districts of Northern Province in Rwanda.

Findings on "**Comparison of performance of procurement procedures and manual procurement after introduction of e-procurement in Districts of Northern Province in Rwanda**", The finding of the researcher on the comparison of performance of procurement procedures and manual procurement after introduction of e-procurement in Districts in Northern Province showed that e-procurement is far better than the traditional procurement.

The respondents agreed that there is efficiency of the public procurement cycle in their districts after introduction of e-procurement and were perceived with an aggregate mean of 3.58 (strong) and standard deviation of 0.48 (homogeneous). The respondents also agreed that there is openness and transparency of the public procurement in their District after introduction of e-procurement.

The respondent also agreed that there is contract performance management of public procurement of their after introduction of e-procurement and was perceived with an aggregate mean of 3.6 (strong) and standard deviation of 0.32 (homogeneous). The respondents also agreed that there is efficiency in terms of time saving of procurement office of their District after the introduction of e-procurement and was perceived with an aggregate mean of 3.7 (strong) and standard deviation of 0.47 (homogeneous).

Finally , the study found that there is increase in volume of bidders per tender at their District after introduction of e-procurement and was perceived with an aggregate mean of 3.61 (strong) and standard deviation of 0.32 (homogeneous).

5.2. Conclusion

Based on the results from T-test that aimed to assess whether E-procurement contributed significantly of the improvement of public procurement procedures , the T test was used to test the level of significant , whereby In order to test our hypothesis (df)=104, p-value =1.985 (critical two tails was used) the significant level is between 0.05 above ($p \geq \bar{\alpha}$), this implies that there is statistically significant difference between manual procurement and E-;procurement in public procurement at 5% level of significancy

. Based on the study findings; the researcher acknowledged that e-procurement is very important in the performance of procurement procedures in Districts in Northern Province of Rwanda. E-Procurement system allows all public transactions to be conducted electronically. These include registration of government suppliers, preparation and publication of procurement plans, submission and opening of bids, selections and notification of winners, negotiation and signing of contracts, submission of goods delivery notes and transmission of goods inspection and acceptance report, etc. The study concluded E-procurement system, e-evaluation and e-contract improve public procurement procedures in Districts of Northern Province in Rwanda and that the performance of procurement procedures has been improved upon introduction of e-procurement in Districts of Northern Province in Rwanda.

5.3. Suggestions

This study considered the effect of e-procurement system on performance of public procurement procedures in Districts in Northern Province in Rwanda and formulated recommendations that can improve the e-procurement system and public procurement procedures. This section provides recommendations for various stakeholders based the research findings. The suggested recommendations are beneficial to management and future

studies. 5.4.1 Recommendation for Management In relation to the study, findings show that the relationship between e-procurement practices and supply chain performance should be eliminated, security measures related to the e-procurement system should be improved, and management should take the lead in the implementation of electronic procurement.

This research also suggest that institutions implement a user-friendly technology system where most vendors can easily use. In effect, minimize bias in using electronic procurement and everyone will accept it. Finally, the Ghanaian health service should often improve its internal processes to reduce red tape and stress the need for management to integrate suppliers into their electronic procurement systems in the organisation's supply chain performance effectively.

5.4. Suggestion for Further Study

The general objective of this study was to study the effect of e-procurement system on performance of public procurement procedures. Further study in future can be done with emphasis on analysis of the contribution of e-supply chain management on the financial performance of firms. Also, a study on gap in e-procurement system should be conducted.

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APPENDICES

RESEARCH PROJECT QUESTIONNAIRE

Re: Introductory Letter to Respondents

Dear Respondent,

I am TUYISENGE Vincent, a student at the Kigali Independent University ULk finalizing Masters of business administration . As part of the requirements for the degree award, Researcher has to present thesis project. The study is all about the *"*e-procurement management on improvement of public procurement procedures"*;* I am now on my field part of collecting information for this thesis, and you are kindly requested to respond to the various questions in the questionnaire attached. Your responses are treated with great confidentiality.

I would be grateful for your cooperation.

Thank you.

TUYISENGE Vincent

SECTION I: SOCIO-DEMOGRAPHIC OF RESPONDENTS

1. **Gender**

Male [ ] Female [ ]

2. **Age**

Between 21 and 30 years old [ ]

Between 31 and 40 years old [ ]

Above 41 years old [ ]

3. **Level of education**

Masters and above [ ]

Bachelor's degree [ ]

Secondary level [ ]

How long have you been working in field which involve procurement procedures in district of Northern Province of Rwanda?

Less than 1 year [ ]

2-3years [ ]

4-6 years [ ]

7 years and above [ ]

Please, tick the area which corresponds to your most appropriate answer in front of every statement accordingly.

Strongly Agree	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
SA	A	N	D	SD

SECTION II: Effect of E-procurement system on performance of Public procurement procedures in Districts of Northern Province of Rwanda

Analysis of effect of e-procurement system		**SA**	**A**	**N**	**D**	**SD**
1	**Effectiveness of e-bidding in public procurement cycle**					
	E-bidding rules and procedures are simple, clear and ensure access to procurement opportunities;					
	E-bidding Promoted competition via public procurement procedures					
	E-bidding facilitated the means of advertisement of tender					

2	**Contribution of e-evaluation to the openness and transparency of the public procurement procedures**					
	E-evaluation increased Transparency of public procurement information					
	Due to e-evaluation the Level of unsuccessful public procurement processes decreased					
	By E-evaluation the notification of tender award become easy					

3	**Contribution of e-contract in Contract performance management**					
	By e-contract the suppliers are delivering the right thing at the right time					
	E-contract platform enables the safekeeping of performance security					
	By e-contract communication of issues related to contract become easy					

4	**comparison of performance of procurement procedures and manual procurement after introduction of e-procurement**					
	How do you rate efficiency of the public procurement cycle of your District after introduction of e-procurement					
	How do you rate the openness and transparency of the public procurement of your District after introduction of e-procurement					
	How do you rate the contract performance management of public procurement of your District after introduction of e-procurement					
	How do you rate efficient in terms of time saving of procurement office of your District					
	How do you rate the increase in volume of bidders per tender at your District after introduction of e-procurement					