Effect of E-Procurement Adoption on the Procurement in the Public Institutions in Rwanda

A Case of Three District Hospitals in Southern Province

GAKURU Jean Marie

A dissertation submitted to the School of Graduate Studies in Partial fulfillment of the Requirements for Award of Master of Science in Procurement and Supply Chain Management of the UNIVERSITY OF KIGALI

ABSTRACT*: - The purpose of this study was to analyze the effect of e-procurement adoption on the procurement in the public institutions in Rwanda. Despite, public health facilities in Rwanda, being companies like any other, are prone to similar challenges. In conducting this research, three objectives were laid out to assess the effect of e-procurement on good governance in public hospitals, to investigate the extent to which e-procurement technical skills contribute to the effectiveness of procurement in public hospitals and finally to analyze how ICT infrastructure contribute to development of markets in the public institutions. To achieve these objectives, literature was reviewed on the subject matter, and data were collected from 96 employees of three district hospitals in Southern Province, 21 suppliers as well as 24 service providers and they were chosen by using universal sampling technique. Questionnaire, interview and documentation were used as tools of data collection. The study found that the three (3) district hospital representing the public institutions, have adopted e-procurement by equipping their staff with the necessary competencies and skills to ensure the success of their e-procurement projects. This level of commitment stems from statutory requirements for every institution to do all their procurements online. Public institutions have implemented e-requisition, supplier selection, e tendering, tender evaluation, supplier relationship management and procurement record management to very great extents. The study also found that e-sourcing, e-tendering, e-tender evaluation, supplier relationship management and procurement record management on the operational performance of public institutions have a positive and statistically significant effect on the operational performance of public institutions in the public institutions.*

CHAPTER ONE

INTRODUCTION TO THE STUDY

Introduction

Recently, the use of internet supported procurement has arisen as in fundamental component of e-business in modern firms (Mishara & Barua, 2007) as well as in public institutions. Indeed "e-procurement" has probably been the trendiest word in the public procurement profession in recent years (Alsaç, 2017). E-procurement has been widely recognized for carrying the potential to significantly increase the buyers' and sellers' benefits. This chapter includes the background of the study, the statement of the problem, the objectives of the study, the research questions, and the scope of the study and the significance of the study.

Background to the study

Over the world, E-procurement which has been offered varied interpretations simply refers to the process of purchasing goods and services electronically (internet-enabled) required for an organization's operation (Mitchell, 2017).

In developed countries including USA, Germany and in England; e-procurement refers as business to business 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 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. The Deutsche Bank research (Meyer, 2011) established that a full transition to e-procurement could generate savings of between 50 billion and 70 billion Euro. Earlier research had shown that the extent of e-procurement infrastructure integration between organizations had a direct impact on the savings and benefits obtained by an organization.

A review conducted by Commonwealth of Australia indicates that the National governments of Italy, New Zeeland, Scotland, New South Wales and Western Australia in 2005 revealed that these countries were already using e-procurement system for public procurement activities. Implementation of e-procurement is an elaborate process and requires transformation and restructuring of government procurement structures. The process requires electronic systems for: demand estimation, budget definition, needs notification, sourcing, contracting and ordering and supply monitoring (Howard, 2005).

Within Middle Eastern countries, E-procurement is gradually replacing the traditional procurement processes of tendering and increasing efficiency and effectiveness the process of sourcing input products and services at low cost, while ensuring that such inputs meet the specific technical and tendering requirements (Ong, 2014). It is based on this background that Kohli (2012) defines e-Procurement/ e-Tendering as "conducting on the internet the equivalent of the manual tendering process, with the ostensible objective of enhancing Transparency and Efficiency of Public Procurement".

In Africa, the concept of e-procurement is just gaining popularity especially in the public sector. To deal with the problems of lack of accountability and transparency in procurement activities in the public sector, most African countries have resorted to legal reforms and adoption of procurement. Tanzania for instance put into place e-procurement systems to allow e-sharing, e-advertisement, e-submission, e-evaluation, e-contacting, e-payment, e-communication and e-checking and monitoring to ensure all public procurement activities are conducted online (Leo Sun, 2009). According to Murphy (2000), e-procurement is associated with increased efficiency, lower transactional costs, reduced corruption and enhanced control and monitoring of public procurement process. On the other hand, pointed out that e-procurement can lead to improved labor productivity. In Kenya, the government actively got involved in adoption of e-procurement when the Jubilee government came into power. Since then, there has been a lot of pressure and reforms to ensure all public procurement functions are conducted online.

The Kenyan government made it mandatory for procurement of all public goods, works and services to be procured through online platforms. For County governments in particular, there is a directive for all procurement and finance operations to be conducted online. For instance, the government introduced integrated financial management information system (IFMIS) that is mandatory for all the 47 counties. IFMIS was introduced to improve governance by providing real time financial information and effectively programs, formulate budget budgets. It also enhances transparency and accountability and acts as a deterrent to corruption and fraud (Kitwa, 2008). Over the last decade, the Government of Rwanda has undertaken a number of reforms including business registration, public finance management and procurement reforms which have initiated changes to the law and regulations; it has also successfully developed financial management information system FMIS and has installed country wide fiber optic backbone – both of these are huge developments and critical to the success of its vision. Building from these achievements, the Government of Rwanda initiated a project to automate the public procurement cycle known as e-Procurement and was designed to facilitate the transformation of the procurement discipline within Rwanda for the future.

The electronic Government Procurement project was aligned with the e-Government project; e-Procurement System' as outlined in the Government of Rwanda National ICT Strategy 2015 (MINECOFIN, 2016). Rwanda's only system that has made e-procurement possible is termed as "Umucyo." It is a single channel, portal and point of access for Rwanda procuring entities allowing to negotiate better contract terms and to realize savings and achieve value for money. It provides suppliers with increased access to markets without additional marketing efforts and a faster and more efficient

method for quoting and increased order accuracy through receipt of electronic orders. Some public institutions in Rwanda among others RRA, MINIFRA, MINECOFIN, PPA, RDB and the districts have implemented this system or rather started to embrace e-procurement which was expected to be used by all public institutions in the whole country. Therefore, this study aims to assess the application of e-procurement and its effect on the procurement in the public institutions in Rwanda with reference to some hospitals as a case study.

Objectives

In a bid to achieve its mission, the overall objective of the health sector in the recently updated Health Sector Strategic Plan IV (2018 to 2024) is to ensure universal accessibility (geographical and financial) of equitable and affordable quality health services (preventative, curative, rehabilitative and promotional services) for all Rwandans.

This Overall Objective may be attained through four Strategic Objectives:

- Full implementation of the main health programs (improve demand, access and quality)
- Strengthen the health systems building blocks (strengthen policies, resources and management)
- Strengthen all levels of service delivery (organize the services effectively at all levels, referrals)
- Ensure effective governance of the sector (strengthen decentralization, partnership, private sector coordination, aid effectiveness, and financial management).

MoH Vision

The Health Sector Policy (2015) states the overall vision of the health sector as follows: To pursue an integrated and community-driven development process through the provision of equitable, accessible and quality health care services.

Statement of the Problem

Many developing countries suffer from the digital divide, and they are not able to deploy the appropriate infrastructure for e-procurement deployment (Boer, F., & Previtali, P. 2017).

According to Kalakota (2011) reveal that e-procurement can be classified as e-sourcing, e-evaluations, e-ordering, debriefing - through video conference, e- Maintenance Repair Operation (MRO), provisioning re-ordering for stoking replenishment while using bar-codes, and use of web-based enterprise resource planning (ERP).

Ndou (2014) also represented seven main challenges for e-Government development and implementation in developing countries as follows; ICT infrastructure, policy issues, human capital development, change of management, strategy, leadership role, partnership and collaboration among others.

In view of the above, public health facilities in Rwanda, being companies like any other, are prone to similar challenges. In such a highly competitive e-procurement environment nowadays, it is necessary for every organization to maintain an efficient and effective e-procurement system to cut administration cost, promote accountability and to keep abreast the market conditions to procure material and services at the right price, quality and time for the public and internal use. Therefore, it is the above problem which prompted the researcher to find out whether e-procurement has positive effects on procurement in public institutions in Rwanda with reference to hospitals.

Objectives of the Study

The study was guided by the following objectives:

General Objective

The study aims to analyze effect of e-procurement adoption on the procurement in the public institutions in Rwanda.

Specific Objectives

- To analyze the effect of e-procurement functionality on good governance in public hospitals,
- To investigate the extent to which e-procurement technical skills contribute significantly to the effectiveness of procurement in public hospitals,
- To analyze the role played by ICT infrastructure on markets development in the public institutions.

CHAPTER TWO

LITERATURE REVIEW

Introduction

In this chapter the researcher reviewed related literature focusing on the application of e-procurement and its effect on the procurement in the public institutions in Rwanda. It reviews how different books reports and how different writers understand what the e-procurement practices of an institution means. Through this chapter, we had a look on theoretical literature review, e-procurement functionality, the theories and types of e-procurement process, importance of e-procurement management process and relationship between e-procurement on performance of public institutions and lastly, we have shown a summary of this chapter.

Theoretical review

The adoption of e-Procurement is highly influenced by the level of understanding about the benefits (not only financial, but also non-financial) of e-Procurement in a company. If no one is aware of the benefits of e-Procurement there is little incentive to adopt it. An understanding of the benefits of e-Procurement indicates the level of managerial and technological expertise and awareness of new technologies, including e-Procurement (Son & Benbasat, 2007). The major benefits associated with adoption of e-Procurement are real-time information, a flawless procurement process and integrated supply chain. The benefits that can be draw after implementing e-Procurement include improved relationships with supplier, improved purchasing effectiveness, less inventory carrying cost, better price and shorter order cycle time.

Latif Al-Hakim (2012) carried out survey among manufacturers across different industries in Malaysia to investigate the impact of inter-organization trust and dependency on e-Procurement adoption decisions. Authors concluded that dependency, interaction between trust and dependency, and size of company have a strong impact on the adoption decisions while trust has only a modest effect. Eei (2012) surveyed the existing literature on benefits and barriers of e-Procurement in the perspective of Malaysian SMEs. The authors have identified three groups of external barriers technology, infrastructure and legislation, and environment. Meanwhile resource constraints and organizational characteristics form the two groups of internal barriers impeding adoption of E-Procurement.

E-Procurement is considered one of the major reforms in public procurement. Corsi (2006) argued e-procurement as the use of electronic methods over the internet to conduct procurement functions: identification of requirement, tendering process, payment and contract management. The rationale behind e-procurement is to enhance efficiency and effectiveness and transparency and accountability in public procurement (Hardy & Williams, 2011).

E-procurement has gained popularity especially with the advent of technology (Uddin, 2015). Rapid development of e-procurement was reported in early 2000 (Ahlström, 2010). By the end of the same year, it was reported that many public organizations were maintaining web presence in at least some stage of their procurement processes with some participating in online bidding. Eadie and Carlisle (2007) suggested that e-procurement was 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 (Muhammad, 2013). By extension, e-procurement contributed in reducing maverick buying (Uddin, 2015). Rankin (2012) notes that e-procurement result in reduction in paperwork and this leads to lower administration costs.

In the United States of America, Ashlstrom (2010) pointed out that two most important measures for the success of e-procurement processes are cost and time. It is faster to send a document electronically as compared to the manual method of sending tender documents through post office (Kaali, 2017). This contributes 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 (Cusumano and Selby, 2014).

Technology Acceptance Model Theory (TAM)

With the growing technology needs in the 1970's, and increasing failures of system adoption in organizations, predicting system use became an area of interest for many researchers (Chuttur, M. 2009). However, the scholars have argued that most of the

studies carried out failed to produce reliable measures that could explain system acceptance or rejection (Davis, F.D. 1989).

The Technology Acceptance Model (TAM) developed by Davis is based on TRA and tailored towards the acceptance of information technology (IT). A key purpose of TAM is to provide a basis for tracing the impact of external variables on internal beliefs, attitudes and intentions.

In his research, two main factors are of prime relevance in explaining system usage: Perceived ease of use which refers to the degree to which a person believes that using a particular system would be free from effort, and perceived usefulness that refers to the degree to which a person believes that using a particular system would enhance his or her job performance. In case the new technological innovations (e-procurement) are compatible to the existing technology (ERP & EDI) then the new technology becomes easy to use by most of the employees, hence the e-procurement systems may be easily implemented.

Resource Based Theory

This theory argues that better performance and sustainable competitive advantage by company could be attained by exploiting valuable, imperfectly imitable, rare and non-substitutable resources (Hart, 1995). A firm with valuable resources as a higher capability of utilizing available opportunities and reduce all forms of threat that exist in the external environment. A resource that is possessed by only a few firms is referred to as a bundle or rare resource. A Bundle of resources or non-substitutable resource is one that is hard for a competing firm to produce an equivalent resource. A bundle of resources or an imperfectly imitable resource is one that is hard to imitate or that which can be replicated at a high cost (Hart, 1995). Daft (1983) lists these resources to entail all capabilities, assets, and organizational processes, firm attributes, information and knowledge possessed by a firm (Hart, 1995).

Peteraf and Helfat (2003) were of the opinion of dynamic capabilities, which implies that resources only have the capability of increasing the value of the firm if they are utilized in a manner takes into consideration the dynamism of the external business environment (Ireland, Sirmon &Hitt 2007).

Resources are described as either tangible or intangible (Mentzer, Bobbitt & Min, 2004). The most frequently discussed intangible resource firm resource is knowledge (Mentzer et al., 2004). The agreement between sellers and buyers concerning the reduction of lead time in conducting business activities takes time, but such learning is strongly directly related to how the supplier perform and how costs was minimized in supply chain relationships (Carter, 2005).

The RBV theory has been subjected to a lot of criticisms for the past 20 years, in which it has been in existence. However, in response Wagner (2006) contends that the prominent source of superior performance is causal ambiguity. This situation makes it difficult for firms since they cannot manage the resources which they are not aware about their existence though it might be necessary for survival in the dynamic environment which comes with the risk of converting prior strengths into weaknesses. Wagner (2006) contends that technological innovations are defined as the desirable practices acquired from efficient technologies. Desirable practices support the technological functions in the delivery of services of high quality and sustain superior performance therefore technological innovation frameworks are resources that fall well within RBV because it leads to improved service delivery and performance.

Empirical Review

A research conducted by United Nations in 2011 on E-Procurement: Towards Transparency and Efficiency in Public Service Delivery revealed that e-tendering enabled federal government save over six million dollars by outsourcing the manual duplication and distribution documents. The study showed that implementation of e-procurement itself is not a guarantee for success in the procurement operations. For this system to succeed there is need for regulations and policies if the system is to succeed. The study also noted that a number of e-procurement programs fail because of poor technology and lack of leadership. Other factors that lead to such failures include: lack of awareness, resistance to change, poor coordination of functions and ineffective implementation programs. Berlin (2006) in his study on The Impact of E-Procurement on the Number of Suppliers: Where to Move to

reported that a lot of empirical literature already exists confirming that e-procurement leads to increased number of suppliers. This study also revealed that different organizations adopt different online strategies for their procurement functions.

Lewis (2014) conducted a study on Essentials of e-Sourcing: A Practical Guide for Managing the RFX Process in an "E" Environment. The study revealed that e-sourcing can be used as a tool to reduce process time, generate sourcing savings and to drive incremental revenues. He further found out that implementation of e-sourcing starts with selection of an e-tool to complement an organizational strengths, followed by change management and training of the staff and other stakeholders where possible.
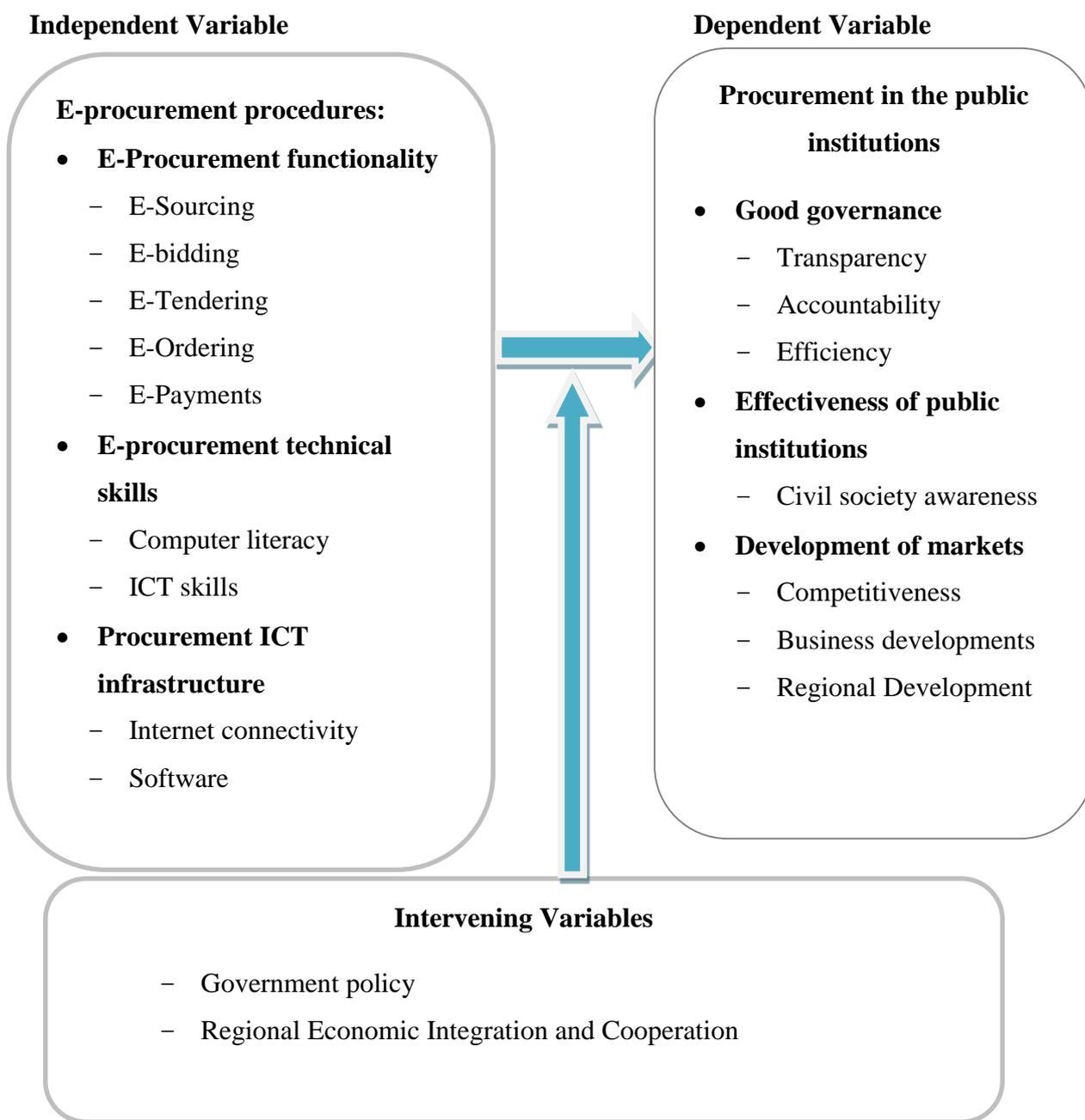
Vaidya and Callender (2016) conducted a study on critical factors that Influence e-procurement Implementation Success in the Public Sector. They found out that despite the efforts put by the governments through reforms towards adoption of e-procurement, adoption of e-procurement still remains a major challenge for many procurement functions. The findings further revealed that successful implementation of e-procurement established systems and feedback mechanism. They associated e-procurement with improved procurement performance. Findings of study done by Roma and McCue (2012) on e-procurement revealed that e-procurement facilitates documentation of the bidding process which in turn enhances transparency and accountancy especially in public procurement. The research further revealed that e-procurement is associated with improved efficiency and enhanced procurement operations. Other benefits of e-procurement include: increased customer satisfaction, improved professionalism in the procurement functions improving public perceptions the procurement function.

Munezero (2015) conducted a study on e-tendering and performance of public corporations in Rwanda Revenue Authority. The research adopted a descriptive research design where the population of interest was employees of Rwanda Revenue Authority. A multivariate regression model was applied to determine the relative importance of e-tendering with respect to performance. It was established that e-tendering allows selection of a suitable contractor at a time appropriate to the circumstances and hence enhances the performance of organizations.

Ntayi (2011) examined the relationship between procurement practices, collaborative relationships and supply chain performance of Uganda's Small and Medium Enterprises (SMEs). Findings revealed that procurement practices and collaborative relationships were significant predictors accounting for 29.6% of the variance in supply chain performance of SMEs. These findings raise implications for owners / managers of SMEs as well as policy makers such as putting in place systems to support collaborative relationships and improve procurement practices to ensure professionalism in order to improve supply chain performance in terms of timely deliveries, flexibility and customer satisfaction.

Conceptual framework

Independent Variable   **Dependent Variable**

E-procurement procedures:

- **E-Procurement functionality**
  - E-Sourcing
  - E-bidding
  - E-Tendering
  - E-Ordering
  - E-Payments
- **E-procurement technical skills**
  - Computer literacy
  - ICT skills
- **Procurement ICT infrastructure**
  - Internet connectivity
  - Software

Procurement in the public institutions

- **Good governance**
  - Transparency
  - Accountability
  - Efficiency
- **Effectiveness of public institutions**
  - Civil society awareness
- **Development of markets**
  - Competitiveness
  - Business developments
  - Regional Development

Intervening Variables

- Government policy
- Regional Economic Integration and Cooperation

Source: Researcher compilation, 2022

Research Gap

Though lot of research has already been carried out in the area of CSF identification and their evaluation framework, however, these studies are limited in scope because they were conducted in different national culture. Azadegan (2008) brought out that the faster pace of technological evolution has made adopting new technologies, such as those used for electronic procurement, a common practice. But not all firms uniformly adopt all technologies. This difference in adoption of e-procurement system is among other things influenced by national culture.

Batenburg (2017) in his study found that there are differences with respect to e-procurement adoption based on national culture, and that firms from countries with a low uncertainty avoidance such as Germany and the UK are the early adopters of e-procurement, while countries that are less reluctant to change such as Spain and France have lower adoption rates.

Joo and Kim (2014) also brought out that innovation, environment, and organization characteristics are determinants of the adoption of an e-Marketplace. Their study findings indicate that external pressure and organizational size have positive relationships with organizational adoption of e-Marketplaces. As is clear from the discussions above, the existing literature cannot be used for further explain about the application of e-procurement on the procurement processes in the public institutions in Rwanda, this is why the researcher may be further interested to analyze these two variables.

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

Introduction

This chapter presents the detailed procedures to be followed to realize the research objectives. It comprises research design, target population, sample design, sample techniques, data collection, instruments, research procedure, data analysis and ethical considerations.

Research design

According to Travis (2004), the research design is the conceptual structure within which research is conducted; it constitutes the blueprint for the collection of data, measurement and analysis of data. Therefore, the study will use descriptive method because the researcher was based on answers from respondents to describe how e-procurement platform influences the procurement in the public institutions in Rwanda. With this method consisting of administering questionnaire, the researcher collected the data from three district hospitals located in Southern Province that use e-procurement platforms.

Target population and sample size

According to Roger (2003), a population is the group of individuals or body of a peoples or any collection of items under consideration from which samples are taken for measurement. In this study, the target population was 141 respondents including 96 staff working in three district hospitals located in Southern Province; Kabgayi Hospital, Kaduha Hospital and Kibilizi Hospitals, 21 suppliers and 24 service providers. Therefore, the study population equals to 423 persons, these were 63 suppliers, 72 service providers and 288 employees from

departments such as Corporate Services Division (Including Procurement Unit, ICT Unit, Finance Unit, HR Management Unit, Administration & Logistics Unit, Infrastructure, Biomedical, and Maintenance of medical &Non-medical Maintenance, General Direction, planning and business development Unit, Quality Assurance management Unit), Clinical Services Division and the Clinical Research & Education Division etc.

Sample size determination and purposive sampling

Grinnell (2001) asserted that a sample is a process of selecting people to be included in the research study; a sample is to ensure that the sample includes all units of interest to the study.

Marlow (2013) defined purposive sampling as a technique which includes in sample element interesting the researcher. The researcher prioritized purposive sampling technique to choose employees of the Hospitals under Ministry of Health, suppliers and service providers because they have enough knowledge about e-procurement platform on procurement processes in the public institutions in Rwandan context.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND INTERPRETATION

Introduction

The chapter comprises by the data analysis, findings and interpretation of the results as set out in the research methodology. The results are presented through the analysis of e-procurement on the procurement in the public institutions in Rwanda. These results are based on study objectives focused on effect of e-procurement functionality on good governance in district hospitals, the extent to which E-procurement technical skills contribute significantly to the effectiveness of procurement in district hospitals and the role played by ICT infrastructure on markets development in the public institutions. The data are also presented in form of descriptive statistical tables, percentages, mean and standard deviation. Based on study objectives, information was gathered from 141 respondents taken from three (3) District hospitals under Ministry of Health (MINISANTE) in Southern Province;

Kabgayi Hospital, Kaduha Hospital and Kibilizi Hospital, suppliers and service providers. Furthermore, the chapter is organized in such a way where the information from primary data (through the questionnaire) was analyzed by using Statistical Package for the Social Sciences (SPSS) software Version 20.

Analysis and Interpretation

Analysis and Interpretation section is designed by the researcher in order to make sense of the numerical data that has been collected, analyzed and presented from respondents.

Gender of respondents

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	Male	87	61.7	61.7	61.7
	Female	54	38.3	38.3	100.0
	Total	**141**	**100.0**	**100.0**	

Source: Primary data, 2022

Table 4.1 indicates that 87 (61.7%) respondents were male and 54 (38.3%) respondents were female; therefore, both female and male employees are working in these hospitals under Ministry of Health and private companies however gender inequality of respondents was observed although at small rate, where the male are greater in numbers than female categories.

Table 4.2: Age of respondents

Demographic of respondents

This section provided more details about the respondent's profile who participated in the study; in terms of their age, gender, educational level, occupation and the time working within the company.

Distribution of gender respondents

Public institutions mostly use the adult categories employees, because they are mature enough and know how their institutions are working, there is job stability and they are fully responsible at their current works.

4.2.1.2. Distribution of age respondents

Public institutions mostly use adult categories employees, and because they are mature enough, they know how their institutions are working, have job stability and they are fully responsible at their current works.

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	From 25 - 30	48	34.0	34.0	34.0
	From 30 - 35	48	34.0	34.0	68.1
	From 35 - 40	27	19.1	19.1	87.2
	From 40 - 45	12	8.5	8.5	95.7
	From 45 - 55	6	4.3	4.3	100.0
	Total	**141**	**100.0**	**100.0**	

Source: Primary data, 2022

Table 4.2 reveals that majority of respondents, 96, representing 68% are belonging to the age group of 25 – 35 years; 27 respondents, representing 19.1% belong to the age group of 35 - 40 years; 12 respondents occupied 8.5%, have the age group of 40 – 45 years and finally 6 respondents, occupied 4.3%, belong to the age group of 45 – 55 years. Therefore,

implies that all categories of respondents in terms of age have participated in this study.

Distribution of respondents per working experience

Normally, working experience goes hand in hand with doing work assigned effectively, so the researcher needs to know how much the respondents are experienced.

Table 4.3: Years of experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 1 year	9	6.4	6.4	6.4
	1 - 5 years	81	61.7	61.7	68.1
	5 - 10 years	36	25.5	25.5	93.6
	10 years and above	9	6.4	6.4	100.0
	Total	**141**	**100.0**	**100.0**	

Source: Primary data, 2022

Table 4.3 shows that 9 respondents, making up 6.4%, belong to the category of less than a year of experience, majority of respondents 81, making up 61.7 %, belong to experience varying between $1 - 5$ years, 36 respondents occupying 25.5%, belong to experience varying between 5 -10 years and finally 9 respondents, making up 6.4%, are belonging to experience varying within 10 years and above; therefore with better human development policies undertaken by public hospitals, which provide higher engagement levels that improve company culture and increase productivity, ultimately creating a positive impact on the company's efficiency and effectiveness.

Effect of e-procurement functionality on good governance

E-Procurement functionality applied by the three (3) District hospitals under Ministry of Health (MINISANTE) in Southern Province and companies always eliminates the need for paper-based processes, and with its automated capabilities, it drastically decreases manual processes and human errors that come with it, even totally eliminating them sometimes. Moreover, majority of respondents said that employees of these hospitals can manage their own purchases based on user permissions, guided buying, e-Catalogs and smart searching tools.

Perception of respondents on effect of e-procurement functionality on good governance

	N	Mean	Std. Deviation
E-procurement functionality within your hospital eliminates unnecessary activities, by allowing them to focus on more valuable tasks.	141	3.57	0.715
E-procurement functionality brings positive effect on fighting against corruption and promote public accountability.	141	4.70	0.689
E-procurement saves money within hospital by preventing duplicate spending, and leveraging volume buying.	141	4.66	0.700
E-Procurement functionality helps ease the payment processes for the goods and services acquired, with minimal errors committed.	141	3.28	0.971
E-procurement processes are less time-consuming than traditional procurement.	141	4.47	0.687
E-procurement facilitates in handling and analyzing reports from many bidders	141	4.74	0.642
Valid N (list-wise)	141		

Source: Primary data, 2022

Table 4.4 indicates that item 1: "E-procurement functionality within your hospital eliminates unnecessary activities, by allowing them to focus on more valuable tasks" responded at lowest mean and the responses were homogeneous (mean= 3.57, SD=0.715);

Item 2: "E-procurement functionality brings positive effect on fighting against corruption and promote public accountability" responded at very highest mean and the responses were homogeneous (mean= 4.70, SD=0.689);

Item 3: "E-procurement saves money within hospital by preventing duplicate spending, and leveraging

volume buying" responded at very highest mean and the responses were homogeneous (mean= 4.66, SD=0.700);

Item 4: "E-Procurement functionality helps ease the payment processes for the goods and services acquired, with minimal errors committed" has very lowest mean and responses were heterogeneous (mean= 2.28, SD= 0.971). Although e-procurement is widely believed to be useful, it was discovered that e-payment has not yet started functioning. The payment process is conducted offline wrist just feeding in the paid amount manually.

Item 5 "E-procurement processes are less time-consuming than traditional procurement" responded at very highest mean and the responses were

homogeneous (mean= 4.47, SD=0.687); Item 6 : "E-procurement facilitates in handling and analyzing reports from many bidders" responded at very highest mean and the responses were homogeneous (mean= 4.74, SD=0.642).

Extent to which E-procurement technical skills contribute significantly to the effectiveness of procurement

E-procurement platform is designed to centralize and automate interactions between an organization, customers, and other value chain partners to improve speed and efficiency of procurement practices. However, there is need to have the necessary skills in order to be able to operate the system efficiently.

Views on the extent to which E-procurement technical skills contribute significantly to the effectiveness of procurement

	N	Mean	Std. Deviation
All employees in the procurement department are trained on basic computer system applications	141	4.53	0.718
E-procurement technical team officials may detect errors committed by other users in the system which effectively check the procurement process	141	1.96	0.932
E-procurement technical skills help Hospital to manage the budget consistently within the agreed financial limits.	141	3.06	0.870
E- Procurement technical skills help in compliance with regulations and controls by examining and analyzing records, reports	141	4.64	0.640
Hospitals are capable and encouraged to develop their own computerized systems to ease their daily work	141	4.85	0.691
E-procurement technical skills by hospital employees help to define, establish, and maintain a quality assurance system and lastly the series of standards	141	4.89	0.598
Valid N (list-wise)	141		

Source: Primary data, 2022

Table 4.5 indicates that item 1: "all employees in the procurement department are trained on basic computer system applications" responded at highest mean and the responses were homogeneous (mean= 4.53, SD=0.718);

Item 2: "E-procurement technical team officials may detect errors committed by other users in the system which effectively check the procurement process" responded at very lowest mean and the responses were heterogeneous (mean= 1.96, SD=0.932);

Item 3: "E-procurement technical skills help Hospital to manage the budget consistently within the agreed financial limits" has lowest mean and

responses were heterogeneous (mean= 3.06, SD= 0.870);

Item 4: "E-Procurement technical skills help in compliance with regulations and controls by examining and analyzing records, reports" responded at very highest mean and the responses were homogeneous (mean= 4.64, SD=0.640);

Item 5: "Hospitals are capable and encouraged to develop their own computerized systems to ease their daily work" responded at very highest mean and the responses were homogeneous (mean= 4.85, SD=0.691);

Item 6: "E-procurement technical skills by hospital employees help to define, establish, and maintain a quality assurance system and lastly the series of standards" responded at highest mean and the responses were homogeneous (mean= 4.89, SD=0.598).

Information and communications technology (ICT) has enabled the creation of tools to organize, transmit, store and act on information in digital form in new ways through e-procurement practices. This links up the market with the vendors hence opening up a wider market.

Role played by ICT infrastructure on markets development in the public institutions

Table 4.6: Perception views on role played by ICT infrastructure on markets development in the public institutions

	N	Mean	Std. Deviation
Availability of adequate ICT infrastructure like fiber Optic in the hospital always helps to identify the great ways through market's competition.	141	4.51	0.748
E-procurement software applied by your organization, offers exciting new opportunities that widen your marketplace.	141	3.53	0.804
Procurement ICT infrastructure development helps to reduce fraud and corruption as there is no personal contact with bidders.	141	4.53	0.620
The management of ICT infrastructure considers computer competencies and skills as prerequisite in the use of e-procurement systems.	141	4.47	0.504
E-procurement ICT infrastructure offers opportunities to improve current and future of market by adding inputs, outputs and outcomes.	141	3.72	0.713
Valid N (list-wise)	141		

Source: Primary data, 2022

Table 4. 6 indicates that item 1: "Availability of adequate ICT infrastructure like fiber Optic in the hospital always helps to identify the great ways through market's competition" responded at very lowest mean and the responses were heterogeneous (mean= 4.51, SD=0.748); Item 2: "E-procurement software applied by your organization, offers exciting new opportunities that widen your marketplace" has lowest mean and responses were heterogeneous (mean= 3.53, SD= .804).

Item 3: "Procurement ICT infrastructure development helps to reduce fraud and corruption as there is no personal contact with bidders" responded at highest mean and the responses were homogeneous (mean= 4.53, SD=0.620); Item 4: that "The management of ICT infrastructure considers computer competencies and skills as prerequisite in the use of e-procurement systems" responded at very highest mean and the responses were homogeneous (mean= 4.47, SD=0.504),

Item 5: "E-procurement ICT infrastructure offers opportunities to improve current and future of market by adding inputs, outputs and outcomes" responded at very highest mean and the responses were homogeneous (mean= 3.72, SD=0.713);

Therefore, as the Rwandan government and other public institutions perceives, the spirit of New Public Management; many innovations are driven by ICT in the public sector and the study showed that several ICT driven innovations from the perspective of e-procurement in the conditions in public hospitals. Findings also show that E-procurement may carry out a number of stages of the procurement, including search, sourcing, negotiation, ordering, receipt and post-purchase review. Thus, it contributes to a more transparent and competitive environment in which government has to operate. However, it was discovered that gaps still exist in terms of infrastructures, like internet connectivity especially in remote places, which impends the use of e-procurement in some public institution.

Table 4.7: Correlations

		E-procurement	Procurement in the public institutions in Rwanda
E-procurement	Pearson Correlation	1	0.611
	Sig. (2-tailed)		0.000
	N	**141**	**141**
Procurement in the public institutions in Rwanda	Pearson Correlation	0.611	1
	Sig. (2-tailed)	0.000	
	N	**141**	**141**

Source: Primary data, 2022

Rules for Coefficient of correlation interpretation:

- **Perfect:** If the value is near ± 1, then it said to be a perfect correlation.
- **High degree:** If the coefficient value lies between ± 0.50 and ± 1, then it is said to be a strong correlation.
- **Moderate degree:** If the value lies between ± 0.30 and ± 0.49, then it is said to be a medium correlation.
- **Low degree:** When the value lies below + .29, then it is said to be a small correlation.
- **No correlation:** When the value is zero.

CHAPTER FIVE

SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATION

Introduction

This section discusses findings as presented in chapter four in the light of the study objectives. Based on the data collected, primary data collected by the use of questionnaire.

Summary of major findings

This section makes great summary on findings obtained through the analysis of e-procurement on the procurement in the public institutions in Rwanda.

To analyze the effect of e-procurement functionality on good governance

From the first objective of the study, findings reveal that reveals that "E-procurement functionality within your hospital eliminates unnecessary activities, by allowing them to focus on more valuable tasks" responded at lowest mean and the responses were homogeneous (mean= 3.57, SD=0.715);

"E-procurement functionality brings positive effect on fighting against corruption and promote public accountability" responded at very highest mean and the responses were homogeneous (mean= 4.70, SD=0.689);

"E-procurement saves money within hospital by preventing duplicate spending, and leveraging volume buying" responded at very highest mean and the responses were homogeneous (mean= 4.66, SD=0.700);

"E-Procurement functionality helps ease the payment processes for the goods and services acquired, with minimal errors committed" has very lowest mean and responses were heterogeneous (mean= 2.28, SD= 0.971). Although e-procurement is widely believed to be useful,

"E-procurement processes are less time-consuming than traditional procurement" responded at very highest mean and the responses were homogeneous (mean= 4.47, SD=0.687);

"E-procurement facilitates in handling and analyzing reports from many bidders" responded at very highest mean and the responses were homogeneous (mean= 4.74, SD=0.642).

To investigate the extent to which E-procurement technical skills contribute significantly to the effectiveness of procurement

From the second objective of the study, findings reveal that "all employees in the procurement department are trained on basic computer system applications" responded at highest mean and the responses were homogeneous (mean= 4.53, SD=0.718);

E-procurement technical team officials may detect errors committed by other users in the system which effectively check the procurement process" responded at very lowest mean and the responses were heterogeneous (mean= 1.96, SD=0.932);

"E-procurement technical skills help Hospital to manage the budget consistently within the agreed financial limits" has lowest mean and responses were heterogeneous (mean= 3.06, SD= .870);

E-Procurement technical skills help in compliance with regulations and controls by examining and analyzing records, reports" responded at very highest mean and the responses were homogeneous (mean= 4.64, SD=0.640);

Hospitals are capable and encouraged to develop their own computerized systems to ease their daily work" responded at very highest mean and the responses were homogeneous (mean= 4.85, SD=0.691);

E-procurement technical skills by hospital employees help to define, establish, and maintain a quality assurance system and lastly the series of standards" responded at highest mean and the responses were homogeneous (mean= 4.89, SD=0.598).

5.2.3. To analyze the role played by procurement ICT infrastructure on markets development in the public institutions

From the third objective of the study, findings reveal that table 4.7 indicates that "Availability of adequate ICT infrastructure like fiber Optic in the hospital always helps to identify the great ways through market's competition" responded at very lowest mean and the responses were heterogeneous (mean= 4.51, SD=0.748);

"E-procurement software applied by your organization, offers exciting new opportunities that widen your marketplace" has lowest mean and responses were heterogeneous (mean= 3.53, SD= .804). Therefore, Rwandan government and other public institutions in the spirit of New Public Management, many innovations are driven by ICT in the public sector and the study showed that several ICT driven innovations from the perspective of e-procurement in the conditions in public hospitals.

Procurement ICT infrastructure development helps to reduce fraud and corruption as there is no personal contact with bidders" responded at highest mean and the responses were homogeneous (mean= 4.53, SD=0.620);

"The management of ICT infrastructure considers computer competencies and skills as prerequisite in the use of e-procurement systems" responded at very highest mean and the responses were homogeneous (mean= 4.47, SD=0.504),

"E-procurement ICT infrastructure offers opportunities to improve current and future of market by adding inputs, outputs and outcomes" responded at very highest mean and the responses were homogeneous (mean= 3.72, SD=0.713).

Furthermore, table 4.7 indicates that procurement in the public institutions in Rwanda equal to 0.611, thus named that there is a high degree between these two variables, therefore e-procurement applied by three (3) district hospitals in Southern Province is made up of product ordering, supplier requisitions, budget authorization, receipting of delivery and invoice processing. E-Procurement software adopted by Rwandan public institutions improves efficiency, savings; spend management and transparency across the entire purchasing lifecycle.

Conclusion

The study concludes that the three (3) district hospitals representing the public institutions, may have to adopt e-procurement by equipping their staff with the necessary competencies and skills to ensure the success of their e-procurement projects. This level of commitment stems from statutory requirements for every institution to do all their procurements online. Public institutions have implemented e-requisition, supplier selection, e-tendering, tender evaluation, supplier relationship management and procurement record management to very great extents. The study also concluded that e-sourcing, e-tendering, e-tender evaluation, supplier relationship management and procurement record management on the operational performance of public institutions have a positive and statistically significant effect on the operational performance of public institutions in the public institutions.

Recommendations

- The three (3) district hospitals in Southern Province should consider full implementation of e-procurement as this greatly improves their operational performance.
- The study also established that commitment to training of employees in charge of e-procurement implementation is the key reason why the e-procurement implementation has succeeded.
- The study recommends that the three (3) district hospitals in Southern Province should set aside adequate budget for regularly training employees on e-procurement implementation and usage.
- RPPA as the National Agency in-charge of public procurement regulation, should employ recent digital technology developments that allow integrated e-procurement solutions covering the public procurement cycle. Therefore, Information and communication technologies should be more used in public procurement to ensure transparency and access to public tenders, increasing competition, simplifying processes for contract award and management, driving cost savings and integrating public procurement and public finance information.
- Three (3) district hospitals in Southern Province should pursue carefully state-of-the-art e-procurement tools that are modular, flexible, scalable and secure in order to assure business continuity, privacy and integrity, provide fair treatment and protect sensitive data
- The three (3) district hospitals in Southern Province
- Should develop and follow an e-procurement standard process when formulating changes to the public procurement system. Such standard process should promote public consultations, invite the comments of the private sector and civil society, ensure the publication of the results of the consultation phase and explain the options chosen, all in a transparent manner.

Study Limitations

This study was limited by:

- ✓ Lack of adequate data from public hospitals where the researcher expects to get them.

- ✓ Some respondents were suspicious about the study and were reluctant to give the needed information. Others even completely refused to respond some of questions asked.
- ✓ It had taken a long time to meet the staff, suppliers and service providers in order to respond to interview questions and they were consulted each other in responding to questions.
- ✓ To have access to annual reports in public hospital were taken long time which led to delay the researcher in the completion of this work.
- ✓ The budget also posed a challenge, as the study had no sponsor.

Suggestion for Further Study

Due to lack enough time and insufficient funds to facilitate the research study, all areas concerning the analysis of e-procurement on the procurement in the public institutions in Rwanda. The researcher however, suggests the following for other interested researchers to study.

- ✓ The effect of e- procurement on the operational performance of parastatals institutions.
- ✓ Influence of e-procurement practices on the performance of procurement in public universities.
- ✓ Effect of e-procurement platform on the performance of public institutions in Rwanda.

REFERENCES

1. Alsaç, G. (2017). Public Procurement and Economic Policy. Annals of Public and Cooperative Economics, 55 (2), 151-158.
2. Andersen, K. V., & Danziger, J. N. (2001). Impacts of IT on Politics and the Public Sector: Methodological, Epistemological, and Substantive Evidence from the"Golden Age" of Transformation. International Journal of Public Administration, 25 (5).
3. Brandon-Jones &Croom, L. C. (2007). "Understanding the incremental nature of e-procurement implementation at the state and local levels", Journal of Public Procurement, Vol. 2, pp. 5-28.
4. Brenda A., & Mahadevan, S. (1991). Probability, reliability, and statistical methods in engineering design. John Wiley.

5. Buckley, J. (2003). "E-Service Quality and the Public Sector." Managing Service Quality, 13 (6): 453-462.

6. Carl, N., & Roger B. M. (1991). "Applied Linear Regression Models", 4th edition, McGraw-Hill Irwin.

7. Chan, X. (2007). Implementation and performance effect on electronic procurement and its ship management companies in India. Information Engineering and Electronic Business, 5, 10-16.

8. Chand & Sons. Kitwa, J. (2008). Performance Decisions and the IT in Business. 2nd Edition, Kampala: Business Publishing Group.

9. Davila, A., Gupta, M. & Palmer, R. (2003). "Moving Procurement systems to the Internet: the Adoption and the use of E-Procurement Technology Model." European Management Journal, 21 (1): 11-23.

10. De Boer, O. (2002). International disciplines on government procurement: a review of economic analyses and their implications, Centre for Economic Policy Research (CEPR), Paper no 4663, 24.