Adoption of e-procurement in Rwandan Public institutions.
Case study of the Ministry of Finance and Economic Planning.
# Table of Contents

List of Figures .......................................................................................................................... 4  
List of Tables ............................................................................................................................ 4  
List of Abbreviation .................................................................................................................. 5  
Abstract .................................................................................................................................. 6  
Acknowledgement .................................................................................................................... 7  
1. Introduction .......................................................................................................................... 8  
   1.1. Background .................................................................................................................... 8  
   1.1.2 Description of Rwanda and its e-procurement system ..................................................... 9  
   1.2 Problem Discussion .......................................................................................................... 10  
   1.3. Purpose of the Research ................................................................................................. 11  
   1.4. Research Questions ......................................................................................................... 12  
   1.5. Disposition .................................................................................................................... 12  
2. Methodology ......................................................................................................................... 12  
   2.1 Research Philosophy ....................................................................................................... 12  
   2.2. Research Strategy .......................................................................................................... 13  
   2.2.1. Quantitative research method ..................................................................................... 14  
   2.2.2. Qualitative research method ....................................................................................... 14  
   2.3 Research Approach ......................................................................................................... 15  
   2.3.1. Inductive research approach ....................................................................................... 15  
   2.3.2. Deductive research approach ...................................................................................... 15  
   2.4 Research design .............................................................................................................. 16  
   2.5. Data Collection in a Qualitative Strategy ....................................................................... 16  
   2.5.1 Primary and Secondary Data ....................................................................................... 17  
   2.6. Sampling ........................................................................................................................ 18  
   2.7. Data analysis .................................................................................................................. 19  
   2.8. Research Quality ........................................................................................................... 20  
   2.9. Research Ethics ............................................................................................................. 21  
3. Literature Review .................................................................................................................. 22  
   3.1. E-procurement ............................................................................................................... 22  
   3.1.1 Definition .................................................................................................................... 22  
   3.1.2 Procurement Process ................................................................................................... 23  
   3.1.3 Benefits of e-procurement ........................................................................................... 26  
   3.1.4 Challenges of implementing E-procurement ................................................................. 28
3.2. Operationalizations

4. Empirical Data

4.1 The Case Study: MINECOFIN

4.2 How e-procurement is applied in Rwanda Public Institution?

4.3 What are the benefits associated with the adoption of E-Procurement?

4.4 What are the challenges associated with the adoption of E-Procurement?

5. Analysis

5.1 How e-procurement is applied in Rwanda Public Institution?

5.2 What are the benefits associated with the e-procurement process in your ministry?

5.3 What are the challenges associated with the adoption of e-procurement system?

6. Conclusion and Answer to the Research Questions

6.1. Validity and reliability implications

6.2 Managerial Implications

6.3. Theoretical Implication

6.4. Limitations

6.5 Recommendations

6.5. Suggestions for Further Research

References

Appendix 1
List of Figures

Figure 1: Procurement Process by Van weel, 2005 .......................................................... 25
Figure 2: Procurement stage and activities (Source: Seminega Augustus, 2010 public procurement user guide) .............................................................................................................. 34

List of Tables

Table 1: List of Respondents .................................................................................................... 19
Table 2: Summary of the Methodology .................................................................................. 21
Table 3: Table of operationalization ...................................................................................... 30
List of Abbreviation

AU  African Union
BACs  Bank Automated Clearing System
EA  East Africa
EPS  Electronic Purchasing System
EDI  Electronic Data Exchange
GDP  Gross Domestic Product (GDP)
GoR  Government of Rwanda
ICT  Information Communication Technology
IT  Information Technology
IFMIS  Integrated Financial Management Information System
MINECOFIN  Ministry of Finance and Economic Planning
MINIJUST  Ministry of Justice
RDB  Rwanda Development Board
RPPA  Rwanda Public Procurement Authority
RRA  Rwanda Revenue Authority
RSSB  Rwanda Social Security Board
RTDA  Rwanda Transport Development Agency
UMUCYO  Rwanda e-procurement system
RFQ  Request For Quotation
CIPS  Chartered Institute of Purchasing and Supply
Abstract

In the modern competitive business environment, government institutions need to embrace information communications technology to remain competitive. Procurement has been recognized as a priority government agenda by many public sector agencies worldwide. In the same line the Government of Rwanda has taken several initiatives to streamline its public procurement system to bring it into line with the fundamental principles of transparency, competition, economy, efficiency, fairness, and accountability. Seminega the director of Rwanda public procurement authority stated that e-procurement can help the Government of Rwanda to reach to the above-mentioned principles. E-procurement can be described as an electronic way of procuring goods and services as well as other procurement process activities with the help of internet and other information and communication technologies systems. Before the adoption of e-procurement in some institutions in Rwanda, all the procurement activities were done traditionally in their institutions and this procurement method has been criticized for having many deficits, that contributed to huge losses in public funds and lacks transparency, accountability, and fair competition. In this regard, the government of Rwanda decided to adopt an e-procurement system in its public institutions. The e-procurement system was launched in August 2016. The pilot stage started with eight public institutions, ministry of finance and economic planning is one of them and it is a case study used in this thesis research. It has been selected by the researcher because it is a cross-cutting ministry in the procurement process. Different forms of e-procurement have been discussed as well as benefits and challenges associated with the adoption of e-procurement. The purpose of this research study is to examine how the e-procurement system is used and explore the benefits and challenges associated with its adoption in Rwanda’s public institution. Qualitative research was chosen, and a case study was conducted in the ministry of finance and Economic planning. The source of data for the empirical is from personal interviews and second data. The findings of the present study demonstrate that the adoption of the e-procurement system brought several benefits to MINECOFIN but also it presents challenges associated with the adoption of e-procurement.

Key Words: Benefits, Challenges, Forms and Process of E-procurement system.
Acknowledgement

First, I would like to extend my heartfelt appreciations to God Almighty for the gift of life, for his love, grace, guidance, and protection, I wouldn’t have been able to reach this far in my education without him, thank you Lord Jesus for fighting my battles.

I am also grateful to my husband and daughter and my entire family especially my mother as well as my friends for their prayers and support.

I am strongly grateful to the Swedish Institute for granting me a full paid scholarship and my Swedish friend family Lars Edqvist and Karin Tunerstedt for their love and support.

My special gratitude goes to my examiner Åsa Gustavsson for helping and understanding me and commenting on my work I would like also to thank my supervisor Petra Andersson for her feedback and support and to all those who opposed my thesis and provided criticism which helped me to improve my work.

I would like to express my special appreciation to all interview respondents who took their valuable time and answered my research questions .I also extend my thanks, to all the lecturers I met during my studies especially Helena Forslund and Fredrik Karlsson for all the knowledge and skills they shared with me.
1. Introduction

The introduction chapter of this thesis research present, the background of the study, where the core concepts of this research are shortly defined. It is also present and explains the statements of the problem (Problem discussion) of this research study and from the problem discussion, the research questions and the purpose of research are generated and presented.

1.1. Background

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 beginning of e-procurement was the creation of electronic data exchange (EDI) in the early 1980s. These EDI systems allow businesses to share and synchronize master data files on goods, costs, requirements, and trade practices (CIPS 2013). In the 1990s, the software was made available on the Internet, and software companies started to create buyer-managed electronic catalogs for vendors. Although the advent of the two rivals "Ariba and Commerce One" gained attention by 2000, e-procurement firms were all specialized in promoting electronic procurement for maintenance, repair and service (MRO) products (Segev Gebauer, & Fäber, 2000). With the aid of the then so-called ‘buy-side solutions’, large companies started to build up their electronic multi-vendor and customer self-serviced catalogs (Tanner, Wölfle, Schubert, & Quade, 2008). Moreover, as the catalogs became outsourced, software companies started to offer the same catalogs to some buyers (CIPS, 2013). Before the emergency of the internet, traditionally procurement was carried out by visiting a store and then following the procedures for placing an order or by looking through catalogs and making a phone call. Thus, at some point, traditionally handling procurement transactions went through slower systemic and had different deficits such as the misuse of time and many processes (Hawking et al. 2004).

Thus, the procurement process is changing from traditional processes to e-procurement; both government and public institutions started turning their procurement activities towards the internet since they found out that all procurement processes would benefit them a great deal if they were properly and properly carried out. Research at the Deutsche Bank (Meyer, 2011) showed that an entire transition to e-procurement could save between EUR 50 billion and EUR 70 billion. E-
procurement has many advantages according to (Nawi et.al, 2016) such as cost savings and increased efficiency. Faster government procurement processes and greater transparency in comparison with traditional procurement methods are also advantages for the application of the e-procurement system. Global e-procurement initiatives in the broad public sector have been undertaken (Henriksen and Mahnke, 2005; Somasundaram and Damsgaard, 2005; Mota and Filho, 2011). As the process is already highly complex (Leukel & Maniatopoulos, 2005), public procurement is challenging substantial policy decisions even more (Henriksen and Mahnke, 2005). Some adoptions and barriers may be common in most of the environments. In Italy studies by Bof and Previtali (2007), Mota and Filho in Brazil (2011), Hardy and Williams in Australia, New Zealand and Scotland (2008) have all suggested similar issues in the coordination of public procurement transformations. However, Fountain (2001) states that the implementation of public-sector technology is rarely simple and should be framed within the ambiguous and constantly transforming limitations of administrative and political prerogatives.

1.1.2 Description of Rwanda and its e-procurement system

Rwanda is a small developing and landlocked country located in East Africa. It is a member state of EA regional interstate organization also a member of AU (African Union). It is the smallest in the Eastern African region having 26,798km2(10347 sq mi). The Gross Domestic Product (GDP) in Rwanda expanded 4.90 percent in the third quarter of 2017 over the previous quarter. GDP growth in Rwanda averaged 2.73% from 2000 to 2017, reaching an all-time high of 13.20% in the fourth quarter of 2002 and a record low of -2.20% in the first quarter of 2013. (Global finance, 2017). The Government of Rwanda has taken some initiatives to streamline its public procurement system to bring it into line with the fundamental principles of transparency, competition, economy, efficiency, fairness and accountability (Tashobya, 2015). Therefore, Seminega director of Rwanda Public Procurement Authority state that, e-procurement can help the GoR to reach the above-mentioned principles. Therefore, the e-procurement system was launched in August 2016. It was given the name “Umucyo” which means transparency in English. the pilot program of the new e-procurement system started with eight government institutions (“Rwanda public procurement authority; Rwanda development board; Ministry of finance and economic planning; Ministry of Justice, Rwanda revenue authority; Rwanda social security board, banks and insurance companies”) Umucyo is the only one system for all public procurement process in
Rwanda and is used by both government and private institutions. Through this web-based procurement system, the Government purchases goods, works, services and non-consultancy services. The system is also used by different suppliers. In addition, the umucyo system has an online portal with advertising, electronic bids and disposal modules, evaluation, contract management, inspection and acceptance, framework agreements, catalogs and shopping malls, which allows suppliers to register and place offers online.

1.2 Problem Discussion

In the modern competitive business environment, government institutions need to embrace information communications technology in order to remain competitive. E-procurement is changing the way the government purchase goods, work and services. Since electronic data interchange and the Internet are used to procure most products and services. E-Procurement has been recognized as a priority government agenda by many public sector agencies worldwide and e-procurement systems have been implemented or are being implemented in many public sector agencies. (Kishor et al, 2006; Mambo et al., 2015). Public procurement activities have a very crucial function as the Government of Rwanda spend a lot of money to procure all goods, works and services needed in all public institutions, before, the adoption of e-procurement in some institutions in Rwanda, all the procurement activities were done traditionally in their institutions and this procurement method has been criticized for having many deficits, that contributed to huge losses in public funds and lacks transparency, accountability and fair competition” (newtimes, 2015). However, (Wittig, 2003; Callender & Schapper, 2003) that stated that a good e-procurement system provides the basic principles of good governance: “transparency, accountability, and integrity.” In this regard, the government of Rwanda decided to adopt an e-procurement system in its public institutions. various research has confirmed the benefits of using e-procurement. Zhang (2016) mentioned different research on the benefits of e-procurement like research of Eakin (2003) on how to measure e-procurement benefits; Quadrem, et.al (2010) studied the benefits of e-procurement adoption; Piotrowicz and Irani (2010) provide research on B2B e-procurement benefits from the perspective of information systems. A survey is conducted by Eei et al. (2012) explored the benefits of e-procurement in Malaysian SMEs. Matunga et al. (2013), assessed the effect of e-procurement on efficient procurement in public hospitals a case study of Kenya hospital in Kisi; Uddin (2015), identified the benefits of using e-procurement over
traditional procurement in the case of Bangladesh. Furthermore, studying e-procurement benefits has been a popular topic for researchers all the time. However, there is no study related to the benefits of e-procurement adoption in Rwanda public institutions a case of ministry of finance and economic planning. Therefore, the author believes that analysing the benefits of using e-procurement in Rwanda's ministry of finance and economic planning is significant. Moreover, given that public institutions in Rwanda have been using traditional procurement for a quite long time, it can be expected that the adoption of e-procurement can face some challenges associated with the use of the e-procurement system. An empirical study in Australia showed that adoption of e-procurement in organizations was faced with a variety of challenges which included: security of transactions; lack of supplier e-procurement solutions; high technology costs; lack of legal framework; lack of technical knowledge; lack of e-procurement skills; lack of any real benefit identified; failure to establish data exchange standards; and lack of data exchange standards. (Hawking, Stein, Wyld, & Foster, 2004). Chipiro (2009) noted that there is little e-procurement research outside the United States (USA) and the service settings for the European private sector. Most e-procurement empirical research has focused on large economies, technologies, and smaller economies and traditional industries (Tatsis; Mena Van Wassenhove & Whicker, 2006; Chipiro,2009). Moreover, according to Uddin, (2015), there are limited empirical studies in the literature on the adoption of e-procurement in developing countries. Moreover, Rwanda is one of the developing countries and very few academic researches on e-procurement adoption has been conducted. Therefore, the author of this research thesis would like to fill this gap by investing challenges associated with the adoption of e-procurement in Rwanda and how e-procurement is applied in Rwanda public institutions by taking the ministry of finance and economic planning as a case study. Moreover, the author of this research thesis believes that this research will add significant empirical information and findings to previous studies on the adoption of e-procurement and challenges associated with its implementation in Rwanda.

1.3. Purpose of the Research

E-procurement has significant benefits compared to traditional procurement. But also, it has some challenges, which hinder its implementation. Thus, the purpose of this research study is to examine
how the e-procurement system is used and explore benefits as well as challenges associated with its adoption in Rwanda’s public institution.

1.4. Research Questions

- How e-procurement is applied in Rwanda public’ institutions?
- What are the benefits and challenges associated with the adoption of e-procurement in Rwanda public institutions?

1.5. Disposition

This thesis research is composed by 6 chapters, in this first chapter the background of the study, problem discussion, research questions and disposition of thesis are presented and explained. The second chapter is methodology part here different research method will be discussed. The third chapter will represent previous literature review on e-procurement process, forms, benefits and challenges an operation table is also presented at the end of this third chapter. The fourth chapter will present the empirical data collected from five interviewees who work in Rwanda ministry of finance and economic planning. The fifth chapter is analysis in this part theory will be compared to the results of empirical data. The sixth and last chapter of this thesis is the conclusion, in this section research questions are answered moreover this section present the recommendation, managerial and theoretical contribution as well as the limitation and suggestion for further research the study.

2. Methodology

2.1 Research Philosophy

According to (Dainty et al. 2007) research philosophy comprises the “epistemological, ontological assumptions. They state that epistemology is an “assumption about “knowledge” it describes ‘how’ researcher perceive about the reality and their expectations on “how” the “knowledge” should be obtained and acknowledged. The ontology clarifies ‘what’ “knowledge is and shows the assumptions about reality”. These epistemological undertakings, ontological assumptions, purposes about the nature of the world and complement the formulation of research philosophy (Ibid); thereby they added that these research philosophies influence the selection of proper
research methods and research approach. Saunders et al. (2009), also describe that research philosophy comprises two assumptions the \textit{epistemology} - “the researcher’s view about the acceptable knowledge” and \textit{ontology} - “the researcher’s perception about the nature of reality” (Ibid, p. 119). Dainty et al. (2007) state that, ontology has two theories, the “realist” (Johnson and Duberly, 2000) and “idealistic” (Gummesson, 1991). The realist’s dawn with a general stand of external reality with prearranged nature and construction (Sexton, 2004) whereas, idealists accepts that “observers may have different viewpoints” and that, “What matters can vary from place to place and from time to time” (Collins, 1983). And regarding the epistemology, Dainty et.al (2007) explains that there are two fundamentally “school of thought” the “\textit{Positivism}” and “\textit{social constructionism}”, the social constructionism derives from the point that “the reality is not objective and exterior”, but is “socially constructed” and explained by individuals (Easterby-Smith et al. 2002), who are conscious and have ideas about their environment around them (Robson, 2002). According to Saunders, et al. (2009) positivism is a technical approach that advocates the idea of natural science. They add that in the positivist approach existing theories are used to generate hypotheses that will be verified to be accepted or rejected. Moreover, Ashworth (2000) declares that in the positivist approach, aspects of the actual world are clearly explained, and science aims to express the world and link it to the theories. Moreover, Bryman and Bell (2015) state that, “Science must (and can) be conducted in a way that is value-free (that is, objective)” (Bryman & Bell, 2015). Furthermore, May (1997) explain that positivistic research involves an objective view of the studied phenomena, therefore the researchers have to describe and analyse the phenomena by considering the empirical data collected through interview, survey, or observation.

The author thinks that the Positivism research philosophy can be applied in this research study as the theory of e-procurement already exists and is known. Existing theory on traditional procurement, e-procurement its benefits and challenges will be collected, and relevant knowledge collected by the author through an interview can be compared and added to existing theories.

\section*{2.2. Research Strategy}

According to Bryman and Bell (2011), researches are categorized into quantitative and qualitative methods of research development.
2.2.1. Quantitative research method

“The quantitative method emphasizes the objective sense of social reality (Bryman and Bell, 2007). In this method, data collection and analysis that take place during the research are gradually translated into the numerical outcome (Ibid). A survey is a major approach to developing quantitative research (Ibid). In quantitative studies, data quantification takes place in both data collection and analysis chapters (Ibid). The quantitative method implicates the positivist perspective (Ibid). The quantitative method emphasizes the testing of theories and hypotheses (Ibid). In this context, Kothari and Garg (2014) say that this method includes the quantitative evaluation of certain features that are exploited to test a phenomenon”.

2.2.2. Qualitative research method

“The qualitative method analyses the collected data in a way that is not possible to translate it into a numerical outcome (Parasuraman, et al., 2006). Qualitative study is more expressing the individuals' attitudes, experiences, and ideas rather than developing the conclusions based on solid facts (Kolb, 2008; Gillham, 2010; Merriam, 2009). Churchill and Iacobucci (2005) state that the personal interview is one of the major approaches for developing qualitative research. Moreover, Gillham (2010) asserts that in qualitative research, the researcher must understand a particular phenomenon, to define a certain issue, and to make possible explanations. The generalizability of qualitative research is relatively lower than the quantitative one (Björklund and Paulsson, 2012). The research questions in this thesis are limited to one public institution in Rwanda. As a result, the limitations expressed lead to reduced accessibility to numerous companies. Following these arguments, the research method in this work is chosen to be qualitative. Moreover, another reason for using this method is that analyses are not expressed in the numerical outcome and the collected data are reflecting the individuals' (interviewees) attitudes and experiences. Personal interviews, which are the major approach of the qualitative method constitutes the empirical study of this thesis”.
2.3 Research Approach

According to Bryman and Bell (2007) and Saunders, et al. (2009), there are two major approaches for developing research; these two approaches are inductive and deductive.

2.3.1. Inductive research approach

“The inductive approach includes the process of data collection and theory development by the means of data analysis (Saunders, et al., 2009). The inductive study requires the collection of data through personal interviews and observation (Ibid). In this regard, Ghauri and Gronhaug (2005) say that an inductive approach, the process origins from observation, then observations enable the researcher to come up with findings and develop a theory. Inductive studies are carried out in order to contribute to the available theories by keeping them up to date (Ghauri and Gronhaug, 2005). In this regard, the theory is a result that has been derived by following the inductive research approach (Ibid). Moreover, Bryman and Bell (2007) assert that in the inductive approach, the main theme of collecting data is to be able to come up with theories. Nevertheless, Ghauri and Gronhaug (2005) assert that this study approach cannot provide precise conclusions, because the data that are used in the analysis of inductive research are based on individual interpretations”.

2.3.2. Deductive research approach

“The deductive approach contains the process that the hypothesis is selected by the researcher, who further intends to analyse and test the truthfulness of the chosen hypothesis (Ghauri and Gronhaug, 2005). In this context, Bryman and Bell (2007) say that in a deductive approach, the theory is collected as a basis, to come up with findings that are possible to be applied to fill the research gap. Moreover, Saunders, et al. (2009) claim that one of the major themes in the deductive approach is to develop explanations about certain characteristics of particular phenomena. In this term, Robson (2002) and Preechawipat and Zhang (2012) categorize deductive research into five phases. The first phase includes the deduction of the hypothesis from the theory (Ibid). The second phase contains the operationalization of the hypothesis in a sense that connects two variables (Ibid). The third phase refers to the test of the operationalized hypothesis (Ibid). The fourth phase consists of the examination of the specific inquiry outcome (Ibid). The fifth and final phase reflects the modification of theory with respect to findings in the case that it is necessary (Ibid)”.
The research approach in this thesis is deductive because this research is aimed at filling the gap of study about e-procurement benefits over the traditional procurement as well as benefits and challenges associated with its adoption.

To reach this objective, this work is based on existing theories and knowledge on e-procurement process, benefits, and challenges. Therefore, theories and interview information are collected to support the analysis and providing findings to fill the research gap.

2.4 Research design

According to Yin (2014), research designs include the relationship between the contextual conditions and "case". Based on this relationship, research design divides into four types; these four types are holistic single-case, embedded single-case, holistic multiple-case, and embedded multiple-case (Ibid). The holistic single-case design takes place when a research study contains one case, and the unit of analysis is limited to only one level (Yin, 2014). Embedded single-case design refers to the research that includes only one case of study and the unit of analysis is more than one (Yin, 2014). A holistic multiple-case design applies to researches that have more than one study case with only one unit of analysis (Yin, 2014).

An embedded multiple-case design covers the researches that have more than one study case which also includes more than one unit of analysis (Ibid).

Following the choice of a qualitative study for this work, an embedded single-case study will be carried out. More specifically, the research design in this thesis is an embedded single-case design, since there are one case study and the 3 units

2.5. Data Collection in a Qualitative Strategy

“Another important part of the methodology is the decision on how to collect relevant data that supports answering the research questions. Therefore, Bryman and Bell (2015) initially distinguish between primary and secondary data sources. In addition, it is necessary what method will be utilized to gather relevant information that can support the researcher. Specially to achieve high reliability the data collection method is crucially important.
2.5.1 Primary and Secondary Data

“Primary data is data that has been newly collected for the purpose of new research (Saunders, et al., 2009). The collection of new, primary data can occur due to two main reasons: no available secondary data or the available secondary data is not relevant for answering a specific research question (Ghauri & Gronhaug, 2005). However, for primary data to be relevant for the research, Zikmund et al. (2012) highlight the fact that information needs to be up to date as the latest information is the main purpose of collecting primary data. Primary data can be collected by either conducting surveys or interviews (Ghauri & Gronhaug, 2005). Hair et al. (2003) describe two different approaches on how to conduct either survey or interviews.

Interviews are considered as the primary method for the collection of qualitative data. The spoken narrative is the basis for the most qualitative data. This narrative is most often obtained through a straightforward meeting between the researcher and the participant (or several participants) through detailed interviews or focuses group interviews. Interviews can be done by telephone, e-mail and, more recently, via social media and micro-blogging (e.g. Skype, WhatsApp, Facebook messaging). Qualitative research interviews may be unstructured, semi-structured, or sometimes structured. With unstructured interviews, the range of possible answers and the specific questions to be asked are not predetermined. The interviews are designed to be informal and conversational to encourage participants to speak naturally. However, the researcher has an idea of the general issues to cover and can use a list of topics as a reminder. Semi-structured interviews use an interview guide to discuss some issues. The questions are designed to ensure that the research questions are answered. However, following tangents or seeking clarification of previous answers, or preparation of answers, there is the freedom to ask questions in any order. Semi-structured interviews are still sufficiently flexible to allow the interviewer to follow the guidelines and the areas of interest. Structured interviews follow a list of questions usually asked in a certain order, but those questions are still open-ended, which means that they usually start with words such as "how," "why," "where" or "when". This distinguishes them from structured quantitative interviews, which usually only ask closed-ended questions—such as ‘how many’ to illicit numerical data. Common to all types of interview format is always the desire to avoid leading questions. The researcher should not lead a participant down a line of thinking.

This research will use direct methods of data collection through semi-structured interviews. The researcher will conduct a computer-based interview approach that uses the internet and email for
this thesis. The author tends to use Skype and telephone interview, to optimize these approaches, the author will give interviewees the interview guide with questions on email before the interviews. Moreover, the author of this research thesis will use secondary data, which is described by Zikmund, et al. (2012) as data that usually occurs in publications, reports and other academic articles that can be found on various databases online. The combination of these two methods will help the author to have detailed information regarding the data.”

2.6. Sampling

According to Bryman and Bell (2011) sampling is a method or procedure whereby the researcher selects representatives from a whole population to collect its empirical data. (Ghauri & Gronhaug, 2005) argued two types of sampling “probability and non-probability”; they explained that in probability sampling each element of the studied population has the same chance of being selected in the sample. While in the non-probability sample unit are not selected randomly, they do not have equal chances of being selected, this is not possible to easily define the boundaries of the studied population (Ibid) and non-probability samples do not all the time properly signify the research population and its features, as they can deliver ambiguous results (Ibid). Moreover, in non-probability sampling, the research questions and objectives cannot be answered by making statistical inferences concerning population characteristics (Saunders et al., 2009). Under the situation of non-probability sampling, researchers choose the one or more units within a universe the author will use non-probability sampling as it applicable in qualitative research which is the research method applied in this research through different conducted interviews. Key interview respondents will be senior managers and procurement officers who were intimately involved with the deployment of the e-procurement system in the ministry. Moreover, only one public institution (MINECOFIN) has been chosen among many more public institutions in Rwanda. Below is the table that presents the interview respondents.
<table>
<thead>
<tr>
<th>Interviewees</th>
<th>Position</th>
<th>Institution</th>
<th>Duration of interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respondent 1</td>
<td>Database administration of e-procurement project</td>
<td>MINECOFIN</td>
<td>1h</td>
</tr>
<tr>
<td>Respondent 2</td>
<td>Business process Manager</td>
<td>MINECOFIN</td>
<td>52 min</td>
</tr>
<tr>
<td>Respondent 3</td>
<td>Procurement officer</td>
<td>MINECOFIN</td>
<td>35 min</td>
</tr>
<tr>
<td>Respondent 4</td>
<td>Procurement officer</td>
<td>MINECOFIN</td>
<td>1h 15min</td>
</tr>
<tr>
<td>Respondent 5</td>
<td>Monitoring officer/ e-procurement Specialist</td>
<td>MINECOFIN</td>
<td>45 min</td>
</tr>
</tbody>
</table>

Table 1: List of Respondents

2.7. Data analysis

The main procedure of the data analysis within research is data manipulation, which allows making sense of the collected information with the help of interpretation (Ghauri & Gronhaug, 2005). According to Yin (2014), when working with data, there are five analytical techniques. The first one is a “pattern matching” that implies comparing patterns in theoretical and empirical data. Research can be approached to investigate new patterns. Alternatively, if a theoretical study provides patterns, testing of these patterns can be approached during analysis. The method allows an internal validity of an empirical study to be increased. The second one is the “explanation building”, which appears as a pattern matching, explains that a researcher examines a case study to provide an account of the case. This type of analysis usually appears in narrative research to explain a phenomenon. The third one is “Time-series” analysis which is a technique that involves analysis using experiments and quasi-experiments. The analysis can be done using simple time series, complex time series or chronological sequences. The goal of an analysis is to investigate the “How” and “Why” within the chain of events that takes place over time. The fifth one is the “logic model” that prescribes matching the events that are observed within an empirical study with theoretically predicted events. In this way, the model appears as a technique that is similar to pattern matching. Moreover, this method can be used in various analytical dimensions and for different purposes and this makes it distinctly complicated. (Yin, 2014)
The author of this research thesis will use a pattern matching as the author intend to compare theory part with the analysis and come up with the conclusion. As it is discussed above by Yin (2014) this method compares patterns in theoretical and empirical data. Moreover, it helps to investigate new patterns and the testing of these patterns can be approached during analysis. Furthermore, the method allows an internal validity of an empirical study to be increased

2.8. Research Quality

According to Saunders et al. (2009), reliability and validity are the two most recognized norms that are used to test and assess the research.

Reliability

Easterby et al. (2008) state that “reliability shows the extent which the data collection techniques and analysis will provide consistent findings”

Robson (2002) presented four threats to assess reliability: “observer bias, observer error, subject or participant error and subject or participant error”. Yin (2014) stated that the reliability purposes is to reduce errors and bias of the research. It ensures that in case another researcher does the same research with the same approach will end up with same results. However, Bryman and Bell (2011) stated that it is difficult to replicate a qualitative research as social and local situations changes with time. Saunders et al. (2009) mentioned that “test re-test, internal consistency, and alternative form” are three approaches to assess reliability while comparing the collected data with the other data from different sources.

In this thesis, the author used the same interview questions for all the five respondents in order to ensure the reliability of the collected data by comparing the findings.

Validity

Yin (2014) highlight three types of valid: “the external, internal and construct validity”. Bryman and Bell, (2011.p.395) stated that the internal validity show if there is a “good match between researchers observations and the theoretical ideas they develop” and external validity can “refer to the degree to which findings can be generalized across social settings” . (Bryman and Bell 2011.p.395). Alexander in his thesis research said that external validity is a crucial aspect in qualitative research as it is not easy to evaluate the generalization of small samples or case studies. Especially the “How” and “why” research questions”. lastly, construct validity refers to main concepts on which the research is built or based on. (Yin, 2014). Academic articles and sources
that explains the same concept of study are used to ensure construct validity (Yin, 2014). In this research thesis, academic articles, journals were used in order to construct a theoretical framework and different interviews were conducted to collect empirical data and findings will be compared to literature. The internal and external validity are being supported as the empirical results of this study are compared with previous literature. Moreover, the construct validity is ensured by different conducted interviews with five employees of the ministry. Besides that, the generalizations of this thesis can also be realized by comparing the existing literature with empirical results.

2.9. Research Ethics

“According to Hart (2005, pp. 298 - 299), ethical issues must be taken into consideration while conducting research. Bryman and Bell (2011) mentioned, several issues which may arise while collecting data such as the “privacy” of interviewers, allowed fraud of interviewers, privacy and secrecy of the collected data as well as for personal information of the participants such as their names, date of birth, address and phone number. The author will take into consideration the ethical issues, an agreement with the research participants will be made with informed consent. The purpose of the research and participation duration of the interviewees will be mentioned in the form. The names of the participants will be kept anonymously. According to (Walsham, 2006), It is crucial to try to reassure the interviewees at the start about the purpose and confidentiality. Interviewers will be informed that they can withdraw from the research at any point in time if they are not interested to participate anymore. Audio recordings of the interview will be done, only with consent from the participants”.

The following table presents the research method used in this study

<table>
<thead>
<tr>
<th>Sub-Chapters</th>
<th>Selected Method/ summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Philosophy</td>
<td>Positivism</td>
</tr>
<tr>
<td>Research Approach</td>
<td>Deduction</td>
</tr>
<tr>
<td>Research Strategy</td>
<td>Qualitative</td>
</tr>
<tr>
<td>Research Design</td>
<td>Single case studies</td>
</tr>
<tr>
<td>Research Quality</td>
<td>Validity and Reliability</td>
</tr>
<tr>
<td>Sampling</td>
<td>Non-Probability</td>
</tr>
<tr>
<td>Data Collection</td>
<td>Secondary and Primary data</td>
</tr>
<tr>
<td>Data analysis</td>
<td>Pattern Matching</td>
</tr>
<tr>
<td>Research Ethics</td>
<td>Privacy and Secrecy of collected data</td>
</tr>
</tbody>
</table>

Table 2: Summary of the Methodology
3. Literature Review

3.1. E-procurement

3.1.1 Definition

E-procurement was previously listed as a priority e-government policy worldwide. One concept says that e-procurement is a complement to a country's e-government system (Schedler, 2007). It forms part of the latest integrated procurement strategy to enhance sustainability and project execution (Nawi et al., 2014). E-procurement theoretical understanding has been described as a general system model. Another more precise description of e-procurement is to consider the roles of the information technology (IT) in running the procurement process using the software and hardware while understanding very well that the position of the software and hardware would promote the idea of e-procurement (Borins, 2002).

E-procurement is a new way to use the Internet and e-mail for online shopping for companies. In addition, it also helps to provide online sales facilities with online technologies. Also described is the exchange of products and services by suppliers and buyers via the Internet and IT applications. Kishor et al. (2007) described e-procurement as the use of Internet-based ICT to perform one or more transactional or strategic procurement activities. David Caffey (2009) describes e-contracting as integration by electronic means, such as internet, web technology and e-commerce, of all procurement activities including buyer requests, authorization, purchasing, distribution, and payment. The Electronic Purchasing System (EPS) automates all procurement activities such as to request storage, approval management, authorization and interface with the financial system of the organization (ibid). (M. Jose Garrido-saminiego et al, 2010) notes that most companies have applied the Internet and information technology to business strategies. One of the areas which have been widely influenced by information technology is procurement. E-procurement is the outcome of applying e-commerce to organization purchasing activities. (Lindija Pulevska-Ivanovska, 2004). The action of conducting procurement operation electronically and paper-free is called e-procurement which consists of the whole operation of procurement such as requisition, approval, shipping, etc. and not just the buying process. E-procurement encompasses “requisitioning, purchasing, transportation, and in-bound receiving process”. It starts with a requisition for an item and ends with invoice payment (ibid). E-procurement is defined as purchasing through the internet and other information networks (Malcom Morrison, 2009).
E-procurement sites can be employed to purchase goods and services, e-procurement software automates purchasing processes, controls inventory reduces purchasing costs, and increases efficiency.

### 3.1.2 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 1: Procurement Process by Van Weele, 2005](image-url)
E-procurement refers to the use of internet-based information and communication technologies to carry out stages of the procurement process, as depicted 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 (2001) 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 statutory 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 e-contract 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).

3.1.3 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-
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.

### 3.1.4 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.

3.2. Operationalizations

This section presents the operationalization of the theoretical framework, the key theoretical concepts related to the two research questions and related interview questions (presented in appendix part) of this study are presented and described in the table below.
<table>
<thead>
<tr>
<th>Research Question</th>
<th>Theoretical Concept</th>
<th>Description of concept</th>
<th>Related Interview questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>How e-procurement is applied in Rwanda public institution</td>
<td>E-procurement process and Forms</td>
<td>The action of conducting procurement activities electronically or with the use of internet-based information and communication technologies is called e-procurement process. Van Weele (2005)</td>
<td>1,2,3,4,5,6,7.</td>
</tr>
<tr>
<td>What are the benefits associated with the adoption of an e-procurement system?</td>
<td>Benefits of the e-procurement System</td>
<td>Can be described as the advantages of using e-procurement process</td>
<td>8, 9</td>
</tr>
<tr>
<td>What are the challenges associated with the adoption</td>
<td>Challenges of e-procurement</td>
<td>Can be described as barriers or obstacles of e-procurement system</td>
<td>10.</td>
</tr>
</tbody>
</table>

Table 3: Table of operationalization
4. Empirical Data

This chapter presents the empirical data from a Rwandan public institution, the Ministry of finance, and economic planning (MINECOFIN). First, overall, the ministry will be introduced, then the data collected during the interview will be presented; these data were collected from interview questions designed to answer the three research questions of this study.

4.1 The Case Study: MINECOFIN

The Ministry of Finance and Economic Planning, (MINECOFIN), is the case study that has been used to find out how e-procurement has been adopted in Rwanda’s public institutions as well as the benefits and challenges associated with the implementation/adoption. M was formed in March 1997 from the joining of the Ministry of Finance and the Ministry of Planning. This was done to improve the coordination between the functions of finance and planning. In the ministerial re-structuring of February 1999, the Ministry took on the function of development cooperation from the Ministry of Foreign Affairs. MINECOFIN was one of the eight institutions selected for the pilot phase for e-procurement system implementation in Rwanda. The ministry has been selected by the researcher as the case study because it is a cross-cutting ministry in the procurement process.

Below are the answers to the interview questions which are related to the research questions of this study. The interview was given to five staffs of MINECOFIN.

4.2 How e-procurement is applied in Rwanda Public Institution?

According to the first respondent most of the public institutions in Rwanda are using the single e-procurement system of the government called Umucyo. MINECOFIN is one of these Rwandan public institutions that use the Umucyo system. While asking the question on how e-procurement is applied/used in their ministry, all respondents replied that, Since July 2016, the ministry uses Umucyo system in its procurements activities. They added that the system is used mainly by the chief of the budget manager (accounting officer), tender committee, procurement unit, and their suppliers(bidders). According to the information available in their public procurement user guide, the chief of the budget manager approves the evaluation report, the bidding document, and sign and approves the contract award. The tender committee is composed of the “Chairperson, Vice-Chairperson and a Secretary”. A procurement officer is a permanent member of the tender
committee and acts as its secretary. The tender committee shall oversee the opening and evaluation of bids. Moreover, it makes the award recommendation for procurement contracts.

The chairperson of the tender committee coordinates the whole process of the evaluation of bids and has to it transparently. Members of the tender committee who take decisions related to the evaluation of bids generally are responsible to the consequences that might come from the decisions taken by the committee. The Secretary to the tender committee prepares the report of the tender committee and any other documents related to public procurement.

When asked if Umucyo e-procurement is linked with other systems. All respondents that the system is linked with the following systems, the RRA (Rwanda Revenue Authority), Banks and insurance companies, RSSB (Rwanda Social Security Board), RDB (Rwanda Social Security board), and NIDA (National Identification Agency).

What is the form of e-procurement do you use in your ministry? When asked the form of e-procurement they use in their ministry, all respondents replied that they use e-sourcing, e-noticing, e-access, e-tendering, e-evaluation through Umucyo e-procurement system. However, according to the fifth respondent e-contract management module is not used 100% they still need to enhance it and integrate it with IFMIS system. She added that e-payment and e-invoicing are done in the IFMIS system, not in the Umucyo e-procurement system.

When asking the question about the extent in which e-procurement system has been adopted in the tendering process, all respondents replied that it is from the preparation of the procurement plan to contract to sign, currently, they are developing the module for contract management as it is not fully implemented. When asking the question about the kind of direct and indirect materials they procure, all respondents replied that the materials which they procure can be either goods, works, consultant and non-consultant services. According to the fifth respondent, goods can be described as any kind of object in liquid form such as fuel, water, etc. it can be also in solid forms such as office equipment such as computers, tables, chairs and other stationaries. It can be also in gaseous form. It can be electricity also. She added that Works can be described as all activities related to construction, renovation of a building, or any installation of materials and consult service is any kind of service which require knowledge like consultancy service such as IT support, training and non-consultant service are these services which don’t need knowledge like cleaning and security service.
When asking the question about the e-procurement process, all respondents replied that e-procurement starts with the preparation of a procurement plan, the second step is the preparation of bidding document, the third step is advertising the tender/or invitation for bids after that the fourth step is evaluation of the bid, the fifth step is contract award, contract implementation and last one is delivery commission. However, the first respondent gave more details he explained that the e-procurement process starts with the planning of the procurement plan which is a report that shows different procurement activities that must be performed the whole year. The tender committee must access all the needs of the ministry and see the estimated cost and kind of method to use while buying them and the time frame needed to make it. Moreover, the tender committee also look the technical specification and then they prepare tender or bid documents. after that they must send it to the chief of the budget manager for approval. the tender /bidding process is closed after 30 days for local tenders and 45-90 days for international ones. Once, the bidding is closed then the tender committee start to evaluate the submitted bids and they have to select the winner and once the chief of budget manager approved the award after that then next step is the contract process, once the contract is made the procurement officer send it to the legal entity and once the legal entity approved it then the procurement officer has to send it to the chief of budget manager for review and once she or he approved it then the next step is to sign the contract and to pay the bidder who wins and after that supplier (the bidder who win) start to supply the goods or offer the consulting services or works. Furthermore, the first respondent also mentioned that suppliers who are not satisfied with the results has the right to complain either to those who published the tender(procuring entity) or to the national level within seven days and in that case, the tender process has to be suspended till the problem is solved (the response time take no longer than 30 days )and once the results from the appeal are out. And in case the supplier who complained is not satisfied again he or she has the right to appeal to the national level "the independent review panel" and the tender process continue to be suspended till the results from the second appeal are out. . Besides that, the second respondent mentioned that, the planning, budgeting and payment process of e-procurement is not done in Umucyo e-procurement system however they are done in other system called IFMIS and invoicing is done in another system of RRA. both IFMIS, RRA are linked with Umucyo -procurement systems they share information needed for the procurement process. Moreover, the fourth respondent mentioned that the tender which is value is not high than 2millions are not published for bidding they just send a request for a quotation to 3 different suppliers and
chose one of them. And for the small tender which value costs less than 300 thousand, there is no competition they just chose one supplier and buy directly from him/her. And such tender only happened once in three months and in case the tender value, is more than 500 million Rwandan francs the contract has to be sent to the ministry of justice for legal opinion and when is less than 500 million it is just sent to the chief budget manager. In addition, the above discussed steps of e-procurement process are presented in the figure below extracted from the public procurement user guide. The figure indicates or summarize different procurement stages (stapes) and activities used in MINECOFIN.

![Procurement stage and activities diagram](image)

Figure 2: Procurement stage and activities (Source: Seminega Augustus, 2010 public procurement user guide).

4.3 What are the benefits associated with the adoption of E-Procurement?

**Price reduction in tendering:**

While asking the question about the cost reduction in tendering
All respondents said that tendering cost has reduced as the cost for printing and scanning tendering documents does not exist anymore as well as postage fees, advertising fees and other costs associated with tender preparation, such as transportation fees for sending tender documents to the post office. The second respondent added that the “administration costs have also reduced as most of the activities under the procurement process are done electronically, there is a paperwork reduction”.

**Reduction in time to source materials:**

When asking the question about the time reduction to source materials all respondents said that the cost has reduced, the fifth respondent explained that “now we don’t need to travel for one place to another to meet or search potential suppliers”. Now it is easy as most suppliers are registered in the system”. “we can access them easily; it is a wider reach”

**Improvement of communication and information flow**

When asking if e-procurement has improved communication and information flow, all respondent replied that communication flow has improved a lot since all activities are done electronically. !” the fifth respondent added that, “anytime, anywhere, information is available 24*7” filling reports can be retrieved in minimal time”. There are no geographical boundaries, the supply chain is beyond the geographical boundaries, local and international bidders get better access to all the published tenders and communicative bidders get prompts alerts in their phone or email”

**Improved planning and control:**

While asking if e-procurement has improved planning and control, all respondents said yes. The first respondent explained that “using e-procurement enhances the budget control by reducing expenditures with the help of a good procurement plan. moreover “now we can check and monitor our orders easily”.

**Shorter procurement cycle times:**

While asking if e-procurement has reduced the procurement cycle times, all respondents said yes, for example, the third respondent said that “now publishing time has reduced, before we used to travel to the different newspaper office for publishing the tender but now we just post the advert in our system and also the time to open the bid has reduced before all bidders were supposed to be present while opening the bids but now we just upload it in the system.” However, the bidding process did not reduce still it is closed after 30 days for local tenders and 45-90 days for
international ones. Moreover, all respondents said that as there is no more physical contact between bidders and the tender committee, therefore corruption has reduced. Furthermore, when asking if transparency has increased all respondents said yes. For example, the first respondent added that there is “high transparency and high visibility, most information is available and published in the system. There is equal access to information to all bidders everything is clearer and more accountable”

4.4 What are the challenges associated with the adoption of E-Procurement?

According to all respondents one of the challenges they had, was culture resistance. For example, the fourth respondent explained that: “it took time for some users to get familiar with the system especially the bidders, some don’t understand their reason they must change and adapt e-procurement system, others are not confident if they will manage to use the system well”. Moreover, the third respondent added that despite the training given to suppliers few of them especially those who live in villages still fail to get familiar with the e-procurement system and some are no longer participating in bidding as they used to do. due to a lack of technology skills, fear of technology, and cultural resistance. the first respondent also confirmed that he said that: lack of technology skills was a challenge as some staffs don’t have IT skills and are not familiar with technology, therefore this was a challenge as we had to provide a very high IT support and more training to the users of our e-procurement system. Furthermore, he added that some suppliers do not believe or trust that the documents they submitted have been reached, and by consequences, they upload many documents which are not required and this slower the system”.

another challenge which has been pointed out by all respondents is the network connection which is not strong enough not only in villages but also in cities. for instance, the first respondent said that: “most suppliers/bidders do not have Wi-Fi most of them have to go to cyber internet coffee or use internet bandwidth which most of the time is not strong enough thus, sometimes it takes time for our suppliers to upload the documents into the system due to poor internet. The first respondent also added that IT infrastructure in some places is not advanced. he said that: our country Rwanda is a developing country; thus, the internet and electricity are not yet in all the places mostly in villages. Another challenge that has been pointed out is the problem with other linked systems. for example, the fifth respondent said: “our external linkage systems can sometimes be a source of technical
issues. we constantly work with linkage systems owners to fix any issues. For example one of the
documents which bidders have to submit or upload in the system is the bid security but it is the bank
or insurance company that has to send it to the system, not the bidder so sometimes the bank or
insurance company delays to submit it due to many people they have (because many bidders wait and
go to ask it last time when the submission date is close) or it might delay due to technical issue and
this affect the bidder as he or she cannot win the tender if one of the required documents is missing.
He added that the procurement department should consult document issuing entities or the Project
Support Team to avoid unfairly disqualifying bidders or lengthy claims”

The second respondent also alleged that: “there is another challenge regarding the laws of
electronically copied documents which are unsettled yet. Such as the law on an electronically
signed contract which still needs other supporting documents in order to be approved”. He
added that is kind of double work preparing online and offline contract, it is also the same for
tender documents, we are enhancing the system to bridge this gap.

5. Analysis

In this analysis chapter, theories will be compared to the results of empirical data. This will help
the author of this study to her own ideas and analyse the research questions.

5.1 How e-procurement is applied in Rwanda Public Institution?

As discussed above, all respondents replied that since July 2016, MINECOFIN started to use the e-
procurement system in its procurements activities. according to the first respondent, the e-
procurement process starts with the planning of the procurement plan which is a report that shows
different procurement activities that must be performed the whole year. This is in line with what is
stated by (Bodnar and Hopwood 2004), that a purchase requisition is an internal document that
presents the demand for procurement of goods and services and ensures the availability of products at
a specific. Moreover, they said 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. Also, Van Weele (2005), stated that: the first phase of tactical purchasing is called
specification, and all the requested materials and services for preserving and developing direct and
indirect production activities are identified in this phase. by regarding the findings from the
respondent and the above mentioned previous researchers, the first step of e-procurement start with procurement plan which can be described as report which specifies or shows different procurement activities or products that have to be performed or procured. This step is crucial as it helps institutions to make a better plan and good procurement decisions. Therefore, it is good that first step discussed by van weel (2005) and Bodnar and Hopwood (2004) is also applied in Minecofin. Furthermore (Bodnar and Hopwood 2004), mentioned that 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. This is similar to what the first respondent mentioned: the tender committee must access all the needs of the ministry and see the estimated cost and kind of method to use while buying them and the time frame needed in order to make it, after that secretary of the tender committee has to send it to the chief of budget manager for approval. According to Van Weele (2005), the second step of the procurement process is the selection of suppliers, it refers to the identification, evaluation as well as the selection of a supplier among other suppliers. This has been also discussed by (Bodnar and Hopwood 2004), they explained that the second step is Source selection which is the process of conveying a source of supply to the purchase requisition second step is Source selection which is the process of conveying a source of supply to the purchase requisition. They explained that this process helps organizations to identify the supplier who must supply the requested products and in case there is a supplier who has already a contract with them and can be able to supply the requested products then the appropriate purchase amount request will be proposed. In case no supplier has a contract with them then the next step is to send quotation (RFQ)” to the chosen suppliers and after that, then 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. However according to the fourth respondent, the RFQ is used only for tenders which value is not higher than 2 million Rwandan francs. The tender committee just sends the RFQ to three chosen suppliers and from them, they chose one supplier who is able to supply the requested products and this kind of selection method is only used once in 3 months. And for the small tender which value costs are less than 300 thousand Rwandan francs, there is no competition they just chose one supplier and buy directly from him/her. Otherwise, the method used in their ministry is open bidding where various suppliers compete for one or different tender(s). Based on the findings, it is clear that the second step of e-procurement steps “Source selection” discussed Bodnar and Hopwood (2004) is not always
applied in MINECOFIN as the procurement method which is mostly used in MINECOFIN is an open competition and various suppliers have equal right to bid the tender and the winner of the tender or selected supplier will be chosen after evaluation. There is no selection of suppliers unless the tender value is not higher than 2million. In MINECOFIN, the second step is to publish or advertise the tender notice in the Umucyo system first. then suppliers can access it and start to prepare their bids and once the bidding process is closed then the next step is to evaluate the submitted bids and select the winner. After the selection of the winner then the contract process starts and under the contract and payment is done according to what is written in the contract. This is similar to what Van weele (2005) mentioned, he said that the contract process starts after the selection process, and during the contract process, prices are negotiated, and payment is concluded. After the next step is ordering in this phase goods and services are ordered from the selected suppliers with whom contracts have been done before. Then comes the monitoring phase, which refers to the tracking of deliveries of goods and services and the last phase is the evaluation of the procurement process (Ibid). However according to Bodnar and Hopwood (2004), after the contract process comes to the receipt of goods, then invoice verification and payment is the last step of the procurement process. I can say that according to the findings all procurement processes have almost the same steps or stage however some differences may occur in the second and last stages or process. for example, according to (Bodnar and Hopwood 2004), the payment step is done after the goods have been received. However, according to the first respondent payment modality is concluded under contract negotiation. sometimes, suppliers are given an advance payment of 20% of the whole payment.

5.2 What are the benefits associated with the e-procurement process in your ministry?

**Price reduction in tendering:**

According to findings, the use of e-procurement system has decreased the tendering cost. All respondents said that paperwork has reduced, therefore cost for printing and scanning tendering documents does not exist anymore as well as postage fee, advertising fee and other costs associated with tender preparation, such as transportation fee for sending tender documents to post office. the “administration costs have also reduced as the activities under the procurement process are done electronically, there is a paperwork reduction”. This is similar to what Rankin (2006) claims in
his research that e-procurement decreases paperwork, contributing to lower administration costs. He added that costs such as intra-company mail, phone charges, postage, photocopying, and storage which organizations used to deal with are no longer existing. He added that e-procurement automates the entire procurement-to-payment process, increasing efficiency and eliminating unnecessary expenses. Furthermore, (Morris et al., 2000; Rayport and Jaworski, 2001; Smart and Harrison, 2003), added that e-procurement system can also reduce those costs associated with data errors and inaccuracies inherent to manual processes. Based on findings, the author of this research thesis also confirms that the use of e-procurement decreases the tendering cost of an institution as most of activities under the tender process are done electronically.

**Reduction in time to source materials:**

According to findings, all respondents said the time to source materials has reduced as they are no longer travel from one place to another to search potential suppliers as most suppliers are registered in the system, they can access and contact them easily. This is confirmed by Knudsen (2003) who says: "E-procurement is a rapidly successful way to identify and link new sources, a lean communication channel. “Moreover, he said that using e-procurement while sourcing is much less time than to travel from one city or country to another to search for a potential supplier as supplier details can be readily accessible on the internet by just clicking the button. The author of this research also approves that the use of e-procurement system reduces the time to source as everything is done electronically the time which used to be taken by the buyers or tender committee while sourcing the material is no longer existing.

**Improvement of communication and information flow**

According to findings e-procurement has improved communication and information flow, during interview all respondents replied that communication flow has improved a lot since all activities are done electronically. !” the fifth respondent added that, “anytime, anywhere, information is available 24*7” filling reports can be retrieved in minimal time”. There are no geographical boundaries, the supply chain is beyond the geographical boundaries, local and international bidders get better access to all the published tenders and communicative bidders get prompts alerts in their phone or email” Moreover, Eadie et al (2007), mentioned that: "E-procurement is a lean communication channel.” Furthermore, a survey conducted by (Croom 2000) revealed that around 46% of respondents believed that e-procurement would help improve information
flow, and 41% answered that e-procurement would lead to better internal and external communications.

**Improved planning and control:**
Based on findings from the conducted interviews all respondent said that e-procurement has improved planning and control, the first respondent stated that using e-procurement enhances the budget control by reducing expenditures with the help of a good procurement plan and helps them to check and monitor their orders easily. Moreover (Flicker and Holler, 2000) confirms that 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) and can 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.

**Shorter order cycle times:**
According to findings from the interview, respondents e-procurement has reduced the procurement cycle times, for example, the third respondent said that “now publishing time has reduced, before we used to travel to the different newspaper office for publishing the tender but now we just post the advert in our system and also the time to open the bid has reduced before all bidders were supposed to be present while opening the bids but now we just upload it in the system.” However, the bidding process did not reduce still it is closed after 30 days for local tenders and 45-90 days for international ones. Morris et al, (2000) stated that the automation and workflow facilities of e-procurement applications allow organizations to reduce the cycle time of purchases improving the overall flexibility and responsiveness of the system.

Furthermore, findings demonstrate that the e-procurement system increases transparency and reduces corruption this has been confirmed by all respondents who said that corruption has reduced as there is no more physical contact between bidders and the tender committee. The first respondent added that there is “high transparency and high visibility, most information is
available and published in the system. There is equal access to information to all bidders everything is clearer and more accountable. and this related to what Eadie et al (2007) mentioned that e-procurement reduces the maverick buying. Moreover, (Nawi et.al, 2016) state that, applying an e-procurement system provide higher transparency compared to traditional procurement.

By concluding, based on the above-discussed findings both previous researchers and interview respondents discussed almost the same benefits. However, according to the fourth respondent, the tendering process time did not reduce as the bidding time or tender is closed after 30 days as it used to be while using the traditional procurement method.

5.3 What are the challenges associated with the adoption of e-procurement system

According to all respondents one of the challenges they had, was culture resistance. For example, the fourth respondent explained that: “it took time for some users to get familiar with the system especially the bidders, some don’t understand the reason they must change and adapt e-procurement system, others are not confident if they will manage to use the system well. (Uddin, 2015) also stated that resistance to change of end-user is one of the challenges associated with the adoption of e-procurement. Moreover (Rebecca Angeles and Ravi Nath, 2007) stated that when introducing e-procurement buyers must be aware of supplier unreadiness. Min & Galle (2001) added that small businesses are generally resistant to innovation and lack the technological skills needed. Additional to this, findings from the respondents mentioned that lack of technology skills was a challenge as some staffs don’t have IT skills and are not familiar with technology, therefore they had to provide a very high IT support and more training to the users of their e-procurement system. another challenge which has been pointed out by all respondents is the network connection which is not strong enough and most suppliers/bidders do not have Wi-Fi most of them have to go to cyber internet coffee or use internet bandwidth which most of the time is not strong enough thus, sometimes it takes time for their suppliers to upload the documents into the system due to poor internet. (Pastore, 2002; Chaffey, 2002; Segev et al., 1998) also mentioned that poor internet connection is a challenge to e-procurement adoption. Moreover, 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. This has also been mentioned by the first respondent he stated that
IT infrastructure in some places is not advanced. He added that Rwanda is a developing country; thus, the internet and electricity are not yet in all the places mostly in villages. I can say that IT infrastructure such as poor internet connection and electricity is a big challenge to the adoption of the e-procurement system as it is impossible to conduct all procurement activities electronically without the internet and electricity. Another challenge that has been pointed out is the problem with other linked systems. According to the fifth respondent, the external linkage systems can sometimes be a source of technical issues. 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. Furthermore, (Uddin, 2015) said that the immaturity of software and the absence of certain essential features like the one for payment and invoicing reconciliation is also a problem. As mentioned before, MINECOFIN is linked with other external systems and in case one of them has a technical issue it also affects their e-procurement system performance. Therefore, to avoid this problem to add more features or modules to their e-procurement system. As an example, the implementation of the contract management module and audit module is not done yet. Thus, MINECOFIN has to fix or enhance these modules in order to avoid problems related to system immaturity and linkage with external systems.

6. Conclusion and Answer to the Research Questions

In this conclusion part, a short summary of this thesis is presented, and research questions are answered.

The first research question is **How e-procurement is applied in Rwanda public institution?** According to findings Minecofin is one of public institutions in Rwanda that uses e-procurement system. The result of this thesis research found that the Ministry of finance and economic planning in Rwanda (MINICOFIN) uses the Umucyo e-procurement system since July 2016 which is a web-based platform used by public and private institutions. The e-procurement system is normally used in different procurement activities such as the preparation of procurement plan, preparation of bidding documents, advertising of tenders, the evaluation of bids, and contract however the contract management module is not 100% used as they are still developing it. The payment and invoice justification is done in another linked system called IFMIS. So far, the system is linked
with the other seven systems. According to findings forms of e-procurement applications used in MINECOFIN are e-sourcing, e-noticing, e-access, e-tendering, e-evaluation, e-auction form of e-procurement applications. Moreover, MINECOFIN procures both direct and indirect materials. The second research questions stated that: “What are benefits and challenges associated with the adoption of e-procurement in Rwanda”? According to findings, the use of e-procurement has brought significant benefits to MINECOFIN such as price reduction in tendering, reduction to the source material, improvement of communication and information flow, improved planning and control, increases transparency and accountability, reduction of corruption, lower of administrative cost, etc. Despite all those benefits, there also some challenges associated with the adoption of the e-procurement system in MINECOFIN such as culture resistance, lack of IT skills, poor IT infrastructure, the problem with external linkage systems, and immaturity of some module such as the contract management module.

6.1. Validity and reliability implications

As it has been discussed in methodology part the quality of a research, its approaches and findings need to be evaluated in order to be trusted. Saunders et al (2009) mentioned that reliability and validity are the two approaches used to evaluate a business research. To ensure the reliability and validity of this study the author used the same interview questions for all the five respondents and the collected data were compared to the literature review. Different academic articles, journals were used to construct the literature review. Therefore, based on the empirical findings of this thesis research and the literature review, the author of this thesis confirms that reliability and validity of this thesis research has been tested.

6.2 Managerial Implications

This research study aimed to know how e-procurement system is applied in Rwanda public institutions by taking the ministry of finance and economic planning as a case study. Moreover, this study also identified the benefits and challenges of the ministry of finance and economic planning faced by using the e-procurement system. As see in the recommendations part of this thesis research there are some recommendations given that can help e-procurement managers or tender committees to know how they can avoid some challenges associated with the use of e-
procurement systems in their ministry. As all public institutions in Rwanda use the same e-procurement system, it is obvious that some of the challenges are similar such as the problem with external linkage systems and immaturity of some modules such as the contract management module. Therefore, the recommendations given to MINECOFIN can also help e-procurement managers of other public institutions in Rwanda.

6.3. Theoretical Implication

The findings of this study contribute to existing theory by providing information on how e-procurement system is applied in Rwanda public institutions specifically in the ministry of finance and economic planning. Moreover, different researchers from all over the world can know different benefits and challenges associated with the adoption e-procurement system in a developing country such as Rwanda. All that information will add knowledge to the existing body of researchers and fills the research gap of this thesis research.

6.4. Limitations

Due to the restriction of time and the Coronavirus pandemic, it was not easy to get in touch with different public institutions in Rwanda. Therefore, data are collected from one institution only, the Ministry of finance and economic planning and interview was given to only five employees. The research was focused only on buyer sider and only data about benefits, challenges, e-procurement application and procurement process stages and activities were collected and discussed.

6.5 Recommendations

Based on the findings, I would recommend MINECOFIN to Centralize the system, in order to avoid double work and problems with external linkage systems. Besides MINECOFIN should consult document issuing entities or projects support team to avoid unfairly disqualified bidders or lengthy claims which might be caused by technical issues of external linked systems. Moreover, MINECOFIN should develop or enhance the contract management module and reinforce the law on digital contracts to avoid problems associated with digitally signed contact.
Furthermore, so far most of the information, instructions, and documents which are available at the Umucyo e-procurement website are in the English language only, it would be better if they can be available in other official languages especially our mother tongue as most of the users are Rwandan. This will help local suppliers especially those who low skilled and other users who do not know English.

6.5. Suggestions for Further Research

This thesis research used a qualitative method and focused on one public institution. My recommendation for further research could be the use of a quantitative method or survey. Secondly, further research can focus on multiple public or private institutions. Moreover, further research can focus on the seller side or both buyer and seller side, as this one focused on the buyer side only. all those recommended further researches will add significant results and contribution to previous research studies on the adoption of e-procurement in Rwanda.
References


Chartered Institute of Purchasing and Supply CIPS (2013), P&SM: eProcurement, United Kingdom.


Leukel, J. and Maniatopoulos, G., 2005. Product Classification and Description in Public e-Procurement: Are There Lessons to be Learned from Private e-Procurement? In ECEG (pp. 247-256).


World Bank report (2007), Key procurement functions typically and expertise requirement.

<http://www.minecofin.gov.rw, viewed 30 April, 2020>
< http://www.umucyo.gov.rw, viewed 10 April, 2020>
Appendix 1

INTERVIEW QUESTIONS

Below are different questions asked to the five interviewees of this thesis research

1. Kindly tell me about your role and how you are personally involved in relation to the adoption and implementation umucyo e-procurement in your Ministry?

2. How long have you been using the umucyo system in your Ministry? *Probe on when it was fully adopted.*

3. What is the e-procurement process of your Ministry?

4. Who are the users of your e-procurement system?

5. Is your e-procurement system linked with other systems?

6. To what extent would you say umucyo e-procurement has been adopted in public tendering processes?

7. What are the direct and indirect materials do your ministry acquire through the e-procurement system?

8. Based on your experience, please describe the main benefits of using e-procurement in the Public Sector?

9. What is your experience of umucyo e-procurement in relation to the following statements?
   a) Has brought transparency in public procurement
   b) Has lessened Corruption
   c) Has lessened administration cost
   d) Processing of tendering time has decreased. (It has become faster)
   e) Has established an equal opportunity for all
   f) Difficulties in adaptability and willingness of our people to switch to the system has improved planning and control
   g) Has improved communication and information flow Shorter order cycle time

10. Based on your experience, please describe the obstacles you may have encountered which
could hinder the smooth adoption of the umucyo e-procurement system in your ministry?

11. Generally, how satisfied are you with the Umucyo e-procurement system so far? Why do you say so?

12. From your experience, what suggestions or recommendations would you give that can help ensure the successful implementation and adoption of e-Procurement in Rwanda’s public sectors?

Thank you for your time and participation in this research.