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**ASSESSING THE EFFECT OF ELECTRONIC-PROCUREMENT
IMPLEMENTATION ON PUBLIC EXPENDITURE PERFORMANCE IN
RWANDA
A CASE OF RPPA**

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ABSTRACT

The research sought to assess the effect of e-procurement implementation on public expenditure performance in Rwanda: A case of RPPA. The study was guided by the following objectives: To establish the effect of E-Bidding on public expenditure performance in RPPA. To assess the effect of E-Evaluation on public expenditure performance in the RPPA. To establish the relationship between E-procurement and Public expenditure performance in RPPA. To establish the effect of E-Contract on public expenditure performance in RPPA. The study adopted descriptive research design. The study population comprised of 85 staff. Primary data was collected using close ended questionnaires. A pilot study was conducted at the RPPA before the main study to determine potential weaknesses in the data collection instruments. Data was analyzed using computer software called Statistical Package for Social Scientists (SPSS) version 22. The study also sought to determine the

extent to which respondents agreed on the use of E-Bidding increases efficiency in public procurement. From the study findings presented in table, revealed that there is significant positive effects of E-Bidding on public expenditure performance with $\beta = 0.178$, $t = 1.705$, and $p = 0.036$. Based on the regression results, factor of e-bidding and have effects on procurement performance. The researcher sought to determine the extent study participants agreed on the use of E-Evaluation increases efficiency in public procurement. by $\beta = 0.800$, $t = 7.032$, and $p = 0.027$ based on finding there is change of public expenditure due to change of e-evaluation. There is significant positive effects of E-Bidding on public expenditure performance with $\beta = 0.464$, $t = 5.552$, and $p = 0.042$. Also study reveals that there is strong positive relationship between e-procurement and public expenditure by Pearson Correlation Coefficient (r) value which is equal 0.984. the process-procurement should be viewed as an enabling mechanism to make the process of procurement

more efficient in terms of cost, time, and achievement of value for money. Participants agreed on the role of top management leadership and support on implementation of the system. Procurement staffs with professional qualifications such as KISM and CIPS are enablers for a better e-procurement implementation.

Key Words: e-procurement implementation on public expenditure performance

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CHAPTER ONE

GENERAL INTRODUCTION

1.1 Background

In today's dynamic global business competition scenario, web-based technology is no longer an afterthought; instead, it must. With the Internet and information, communication technology (ICT) applications, business entities, they are constrained to shift their operations from the traditional way to the virtual e-business, e-procurement, and e-supply chain philosophy (Lee, Ni &Koc, 2001). E-Procurement has been distinct as the use of Internet-based (cohesive) information and communication technologies (ICTs) to transmit out individual or all stages of the procurement process comprising search, sourcing, negotiation, ordering, receipt, and Post-purchase review (Croom& Brandon-Jones, 2004). Local Authority Plan for e-procurement report (2003) recognizes the three fields where e-purchasing implementation strategy in the public sector should be dedicated to ensuring that the required practices, processes, and systems are developed and rolled out consistently the

public sector. These areas are organization and management, methods, and technology. Batenburg (2017) surveyed on procurement adoption by European firms. The study concluded that country differences in e-procurement adoption and those firms from countries with truncated uncertainty avoidance such as Germany and the UK are the initial adopters of e-procurement. In contrast, Countries that have less unenthusiastic to change, such as Spain and France, have lower adoption rates. Another study was carried out by Greunen et al. (2010) on implementing regulation-based e-procurement in the Eastern Cape provincial administration, South Africa.

In Kenya, the government actively adopted e-procurement when the Jubilee government came into power. IFMIS was introduced to enhance governance by giving real-time financial information and effective programs, formulate a budget. It also improves transparency and accountability and acts as a disincentive to dishonesty and deception (Kitwa, 2008). Over the last decade, the Government of Rwanda has started several reforms, including business recording, public finance management, and procurement improvements, which have

initiated vicissitudes to the laws and regulations; it has also successfully developed the financial management information system FMIS and has installed a countrywide fiber optic backbone – both of these are massive growths and critical to the success of its apparition.

Hence, public entities should ensure that implementation perspectives, such as organization and management, practices and procedures and systems and technology, are incorporated due to their significance in implementing an e-procurement system. (Local Authority Strategy for e-procurement report IBM, 2003). According to UNDP (2010), a reliable procurement system was critical.

1.2 Statement of the Problem

E-procurement systems have been proven within Government organizations as a useful tool for instituting procurement reforms to promote transparency and good governance in procurement (United Nations, 2011). If the purchasing department is inefficient in its possession of goods and services or even works, other sectors would be affected, and sometimes the outcomes can be severed. Subsequently, e-procurement is a way of using the Internet to make it calmer, faster, and less costly to purchase the goods and

services; they require a critical question. Can e-procurement be utilized to enhance organizational performance? E-procurement streamlines the tracking and purchasing process in a corporation.

Nevertheless, there is still some challenge to change. Therefore, identifying whether e-procurement creates value to a procurement process, how, and the benefits of switching from the traditional procurement process to electronic procurement. In the face of a worldwide virus-like coronavirus and human movement across borders, e-procurement can be the best due to its non-human nature.

Other challenges faced, particularly in the traditional purchasing measures consisted mainly of three phases, namely identification phase, gathering phase, and post-ordering stage, have been blamed for several incompetence such as an arrangement of non-value priestly activities, excessive time in processing orders, and high costs of purely transactional activities among others (Lysons& Farrington, 2006). The public sector spends many billions a year on the goods and services needed to deliver available services (OGC, 2008). The government has called on procuring entities and the Government suppliers for goods, works, and services to embrace the e-procurement system. The system increases

visibility, transparency, and accountability in requisition, tendering contract award, and payment. In Rwanda, the disclosure of procurement data is not standard practice, information is fragmented and capacity gaps persist. To mitigate this, E-procurement will be a useful tool for instituting procurement reforms and establishing a fully transparent and open procurement environment. Information and Communication Technology enabled technology. Public e-procurement plays an essential role in promoting transparency, accountability, and efficiency (OECD, 2008).

1.3. Objectives

The objectives of the study were divided into two. General objective and Specific objectives:

1.3.1 General objectives

The general objective of the study was to assess effect of e-procurement implementation on public sector expenditure performance in Rwanda.

Specific Objectives

- 1) To establish the effect of E-Bidding on public expenditure performance in RPPA.

- 2) To assess the effect of E-Evaluation on public expenditure performance in the RPPA.
- 3) To establish the effect of E-Contract on public expenditure performance in RPPA.
- 4) To establish the relationship between E-procurement and Public expenditure performance in RPPA.

1.4. Research questions

- 1) What is the effect of E-Bidding on public expenditure performance in RPPA?
- 2) What is the effect of E-Evaluation on public expenditure performance in RPPA?
- 3) What is the effect of E-Contract on public expenditure performance in RPPA?
- 4) What is the relationship between E-procurement and Public expenditure performance?

CHAPTER TWO

LITERATURE REVIEW

Effect of E-Bidding on public expenditure performance

According to Ajzen & Aman (2020) E-Bidding can be used if the demand/the product can be specified, if the costs are reasonable with regard to the procurement volume and if multiple suppliers exist who show interest in selling the product using an eBidding. Furthermore, competitiveness needs to exist among the suppliers including dynamic prices. Based on the "Kraljic Portfolio Purchasing Model", the demanded products and services can be categorized by the two criteria „Profit Impact" and „Supply Risk". Products and services with a low Profit Impact and a low Supply Risk are called "Non-Critical Items". As Roland Bogaschewsky describes them in his essay "Electronic Procurement - Katalog-basierte Beschaffung, Marktplätze, B2B-Netzwerke", they are usually offered by many suppliers and are of little value. Non-Critical Items should therefore be purchased rather cost-effectively. Ampratwum, (2018) "Bottleneck Items" are products and services which rank high on the Supply Risk dimension and low on the Profit Impact dimension. E-procurement also mitigates

corruption by reducing the degree to which government officials withhold information from non-favoured bidders. By ensuring public access to all procurement data, e-procurement also enhances transparency and the possibility of public oversight Bertot, J. C., Jaeger, P. T (2019).

2.2.2 E-Contract on public expenditure performance

Electronic contracts are growing rapidly and accounting for a huge share of international and domestic trade. Especially in developed countries due to the ease and speed of contracts. This has become even more so since the global commercial establishments are refusing to deal with any new customer who does not use the method of electronic contracting. This requires dealing with the electronic contract and distinguishing it from other contracts from different legal aspects- Contract: An electronic contract is an agreement in which the offer is accepted by an international network that is open to remote communication, in a way that may be audible through the interaction between the offer or and the offeree (Musana 2020). This shows that the electronic contract belongs to the group of contracts that legal

persons have defined as contracts concluded remotely.

2.2.3 Effect of E-Evaluation on public expenditure performance

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, 2020). Authors like Gunasekaran, McGaughey, Ngai and Rai (2020) further emphasized that e-procurement are the current focus of purchasing and supply management. Though, other scholars like Aman and Kasimin (2019) argued that implementing e-procurement is a difficult task for procurement managers particularly, in the public sector. Kotaka (2019) added that e-procurement in the developed economies has received less attention as compared to the attention given to it by developing economies such as Ghana.

2.5. Theoretical framework

Three theories will guide this study: Disruptive Innovation Theory, Stakeholder

Theory, Theory of Change, and Technology Acceptance Theory. These concepts enhance understanding of innovative strategies like e-procurement.

2.5.1 Stakeholder Theory

Over the last periods, the correlation between market value growth in companies and social wellbeing has been called into the issue (Piketty, 2014) from a classical economic perspective (Jensen, 2014). The time might be right for companies to mutually consider creating social benefits and the sharing of that social value among participants (Freeman, 2010; Freeman, Harrison, Wicks, Parmar, & De Colle, 2010). In this situation, the role of multinationals is extremely essential, not only because of the tremendous effect of their activities on the world economy but also because they are possibly the firms that find themselves under the most burden to obtain short-term economic results. At first sight, these firms, closely linked to the globalization process and in which capital, through the stock exchange, plays a relevant role, might be expected to be reluctant to contemplate any approach limiting a shareholder orientation and the generation of value for these actors. In consequence, they may be naturally opposed to the incorporation of stakeholder theory into their

governance. In this regard, and for some decades, the underlying challenge of the approach has been its claim that firms should take responsibility for all stakeholders and not just the shareholders (see, for example, the UN's Patrus describe global Compact signatory corporations' case, Carvalho, Coelho, & Teodósio, 2013).

2.5.2 Technology Acceptance Model

Technology Acceptance Model (TAM) has been considered as a powerful model for explaining and predicting usage intention and acceptance behavior (Yi and Hwang, 2003). Mathieson, Peacock & Chin (2001) argued that TAM's ability to explain attitude toward using an information system is better than the other multi-attribute models. In turn, attitude in TAM is influenced by two key elements determining technological behavior; these are perceived ease of use and perceived usefulness (Davis, 1989; Igarria, Parasuraman & Baroudi, (1996). Davis (1989) has defined perceived usefulness as the degree to which a person believes that using the system will enhance his or her performance and ease of use as the degree to which a person believes that using the system will be free of mental effort.

2.5.3 Disruptive Innovation Theory

Barahona and Elizondo (2012) discussed the theory of disruptive innovation. This theory points out that e-procurement is an innovation. As such, it requires continual progress. Because of such modifications, it interrupts the normal procurement operations and processes. The theory of disturbing design is characterized by a small and expensive client base and non-attractiveness at the initial stages of implementation. Some level of acceptance as the structure is implemented, new competition as innovation continues, and continuous quality improvement improves adaptability to the user and stakeholders' needs.

CHAPTER THREE

RESEARCH METHODOLOGY

3.2. Research Design

The researcher adopted a descriptive and analytical research design. These methods were used because descriptive design helps to systematically ascertain and describe the characteristics of the variables.

3.3. Population of the research

This study targeted the staff of the RPPA from which the primary data was collected. The population in the study considered 85 employees. Morgan table was used as a procedure.

3.4 Sample design

3.4.1 Sample size

Whenever it is not viable, the whole population may not be accessible due to various factors.

3.4.2 Sampling Techniques

The researcher has organized the list of respondents who are the employees RPPA. Due to the small size of the population the census was appropriately used.

Value of r	Strength of relationship
-1.0 to -0.5 or 1.0 to 0.5	Strong
-0.5 to -0.3 or 0.3 to 0.5	Moderate
-0.3 to -0.1 or 0.1 to 0.3	Weak
-0.1 to 0.1	None or very weak

3.5 Data Collection Methods

3.5.1. Data collection instruments

The researcher used both primary and secondary data.

3.5.1.1. Primary source of data

Primary source of data refers to data that is original, gathered by the researcher himself, and it is acquired from its source by using techniques such as questionnaire.

3.6. Data analysis

Regression analysis is the analysis of relationship between dependent and independent variable as it depicts how dependent variable will change when one or more independent variable changes due to factors, formula for calculating it is $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$, where Y is dependent variable, X is independent variable, $\beta =$ Beta Coefficient –This measures how many standard deviations a dependent variable will change, per standard deviation increase in the independent variable

Pearson Correlation – This is the Person Correlation Coefficient (r) value. These values range from 0 to 1 (for positive correlations) and -1 to 0 (for negative correlations). The larger the number, the stronger the linear association between the two variables i.e. a value of 1 indicates a strong positive association and a value of -1 indicates a strong negative association. A value of 0 indicates no such association.

Sig. (2-tailed) – The P value for a two-tailed analysis.

By looking at the results in the above table, it can be seen that the correlation between E-procurement and E-procurement gave a Pearson Correlation Coefficient (r) value of 0.984, which indicates a strong positive association between the two variables. Also, the P value of the association was 0.001

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter highlights some of the important points raised in chapter four and thereafter presents a conclusion in line of what have been observed during the research

process and thereafter comes up with recommendations.

5.2 Summary of the findings

The responses of this study were obtained from people working for the procurement offices, and the other selected departments at RPPA. In line with our objectives set, the following are the major findings:

5.2.1 Objective One: To establish the effect of E-Bidding on public expenditure performance in RPPA.

In this section, the researcher sought to determine from the respondents the extent respondents agreed with various statements on the effect of E-Bidding on public expenditure performance in RPPA. The study findings are presented and explained below.

Concerning the effect of E-Bidding on public expenditure performance in RPPA.

Majority of the respondents representing 50.5% of the total number of the study participants strongly agreed that E-Bidding has an effect on public expenditure performance in Rwanda, followed by 41.1% who strongly agree. 2.3% were not sure followed by 3.0 who disagreed and 2.3 % Strong disagree on the above statement.

On the use of E-Bidding increases efficiency in public procurement.

The study also sought to determine the extent to which respondents agreed on the use of E-Bidding increases efficiency in public procurement. From the study findings presented in table 4.5, majority of the respondents representing 52.9% followed by 38.8% agreed that the use of E-Bidding increases efficiency in public procurement. Only 1.2% of the total number of study participants was not sure. The findings also showed that a small proportion of 4.7% and 2.3% of the respondents disagreed and strongly disagreed respectively that use of E-Bidding increases efficiency in public procurement.

About E-Bidding motivates openness and transparency in public procurement.

The researcher also sought to ascertain from the respondents the extent they agreed on E-Bidding motivates openness and transparency in public procurement. From the study findings presented in table 4.7, majority of the respondents (63.5%) strongly agreed followed by 31.7% that agreed that E-Bidding motivates openness and transparency in public procurement. Only 3.0% disagreed on the statement. However, it is also clear that 1.2% of the study

participants strongly disagreed that E-Bidding motivates openness and transparency in public procurement.

Concerning the organizations level of compliance with procurement regulations.

The researcher also wanted to determine from the respondents the extent they agreed on the organizations level of compliance with procurement regulations. As shown in table 4.8 above, majority of the study participants (62.3%) strongly agreed and 25.8% agree that there is an established the organizations level of compliance with procurement regulations. 2.3% strongly disagreed, 3.0% disagreed, 5.8% were not so sure about the organizations level of compliance with procurement regulations.

The level of transparency and accountability of procurement funds

The study also sought to determine the extent to which respondents agreed on the level of transparency and accountability of procurement funds. From the study findings presented in table 4.5, majority of the respondents representing 52.9% followed by 38.8% agreed there is transparency and accountability of procurement funds. Only 1.2% of the total number of study

participants was not sure. The findings also showed that a small proportion of 4.7% and 2.3% of the respondents disagreed and strongly disagreed respectively that there is no transparency and accountability of procurement funds. E-bidding, would lead to increase in E-procurement implementation by a factor of 0.178

5.2.2 Objective Two: To assess the effect of E-Evaluation on public expenditure performance in the RPPA.

E-Evaluation has an effect on public expenditure performance in Rwanda. E-procurement should be viewed as an enabling mechanism to make the process of procurement more efficient in terms of cost, time, and achievement of value for money. Analysis results are presented in table 4.15 on necessity of Re-engineering the process. 25.9 percent of the respondents strongly agreed, 35.5% strongly disagreed on the statement. 23.5 percent of the respondents were neutral while 9.4% and 5.9% of respondents indicated that respectively.

The use of E-Evaluation increases efficiency in public procurement

The researcher sought to determine the extent study participants agreed on the use of E-Evaluation increases efficiency in public procurement. Findings from table 4.18

showed that 50.5 percent of the respondents strongly agreed, 37.6 percent of the respondents agreed 2.3 percent of the respondents were not sure if the use of E-Evaluation increases efficiency in public procurement, 5.8 percent and 3 percent of the respondents disagreed and strongly disagreed respectively.

E-Evaluation motivates openness and transparency in public procurement.

Findings from table 4.17 showed that, 51, 7 percent of the respondents strongly agreed that E-Evaluation motivates openness and transparency in public procurement. 41.1 percent of the respondent agreed, 1.1 percent of the respondents were neutral while 2.3% and 3% disagreed and strongly disagreed respectively.

E-procurement should be viewed as an enabling mechanism to make the process of procurement more efficient in terms of cost, time, and achievement of value for money.

The researcher wanted to determine from the respondents the extent they agreed E-procurement should be viewed as an enabling mechanism to make the process of procurement more efficient in terms of cost, time, and achievement of value for money. Findings in table 4.18 reveal that 62.3% of

the 85 respondents strongly agreed with the statement, 25.8% agreed, 5.8% were not sure, and 3.0% and 5.3% disagreed. A unit increase in E-evaluation, lead to increase in E-procurement implementation by a factor of 0.800

5.2.3 Objective Three: To establish the effect of E-Contract on public expenditure performance in RPPA. E-Contract has an effect on public expenditure performance in Rwanda.

The researcher also wanted to determine from the respondents the extent they agreed on E-Contract has an effect on public expenditure performance in Rwanda. Findings in table 4.10 reveal that 62.3% of the 85 respondents strongly agreed with the statement, 25.8% agreed, 5.8% were not sure, and 3.0% and 5.3% disagreed.

The use of E-Contract increases efficiency in public procurement.

The researcher sought to determine the extent study participants agreed on the use of E-Contract increases efficiency in public procurement. From the study findings as presented in table 4.11 above, majority of the study participants agreed (42.3%) and strongly agreed (51.7%) respectively that there is use of E-Contract increases efficiency in public procurement.

E-Contract motivates openness and transparency in public procurement.

Findings from the table 4.10 showed that 50.5 percent of the respondents strongly agreed that E-Contract motivates openness and transparency in public procurement, 37.6 percent of the respondents agreed and 2.3 percent of the respondents were not sure, 5.8 percent and 3 percent of the respondents disagreed and strongly disagreed respectively.

E-Contract enhances Contract Management and performance.

Findings from table 4.13 showed that, 51, 7 percent of the respondents strongly agreed that E-Contract enhances Contract Management and performance. 41.1 percent of the respondent agreed, 1.1 percent of the respondents was neutral while 2.3% and 3% disagreed and strongly disagreed respectively.

User involvement, support/communication training.

Findings from the table 4.12, 25.9 percent of the respondents strongly agreed that User involvement, support/communication training. 35.5% strongly disagreed on the statement. 23.5 percent of the respondents were neutral while 9.4% and 5.9% of agreed and strongly disagreed respectively.

Supplier e-readiness, adoption strategy and communication plan, suppliers education.

The study sought to determine the extent to which respondents agreed on Supplier e-readiness, adoption strategy and communication plan, suppliers' education. From the study findings presented in table 4.15, majority of the respondents representing 51.7% strongly agreed followed by 41.1% who disagreed. Only 1.1% of the total number of study participants was not sure. 2.3% and 3.0% of the respondents disagreed and strongly disagreed respectively.

Information matching, sending and receiving of real time information to other information systems. The study also sought to determine the extent to which respondents agreed on whether Information matching, sending and receiving of real time information to other information systems could affect E-Contract on public expenditure performance in RPPA. From the study findings presented in table 4.16, majority of the respondents representing 50.5% strongly agreed followed by 37.6% who disagreed. Only 2.3% of the total number of study participants was not sure. The findings also showed that a small proportion of 5.8% and 3.5% of the respondents disagreed and

strongly disagreed respectively. Unit increase in E-contract, would lead to increase in 0.464 of E-procurement implementation

5.2.4 Objective Four: To establish the relationship between E-procurement and Public expenditure performance in RPPA.

The correlation between E-procurement and E-procurement gave a Pearson Correlation Coefficient (r) value of 0.984, which indicates a strong positive association between the two variables. Also, the P value of the association was 0.001

5.3 Conclusions

In line with research question one which wanted to know the effect of E-Bidding on public expenditure performance in RPPA, based on the findings, majority of the respondents strongly agreed that E-Bidding has an effect on public expenditure performance in Rwanda. In line with research question two which sought to know the effect of E-Evaluation on public expenditure performance in RPPA. Based on the findings, majority of the respondents strongly agreed that E-Evaluation on public expenditure performance in RPPA. In line

with research question number three which wanted to find out on the effect of E-Contract on public expenditure performance in RPPA, the findings shows that, majority of the respondents strongly agreed. In line with research question four which sought to the positive relationship between E-procurement and Public expenditure performance. The study revealed that, Public expenditure performance in RPPA depends on E-procurement and serves as the determinant factor.

5.4 Recommendations

To ensure effect of e-procurement implementation on public expenditure performance in Rwanda, the management of public institutions should improve on the level of compliance with procurement regulations compliance, design and apply better procurement policies, support and

encourage other staff to execute procurement functions in accordance with the procurement regulations and procurement policies, use effective procurement procedures, improve on relationship between management and stakeholders and employ better methods of managing organization resources.

The public training institutions should effectively integrate procurement functions with ICT based systems through application of e-procurement methods., top management leadership and support on implementation of the system .Procurement staffs with professional qualifications such as KISM and CIPS are enablers for a better e-procurement implementation. They agreed on need of Budget allocation for the necessary resources needed for the development of the system.

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