



**E-PROCUREMENT PRACTICES AND PERFORMANCE OF PUBLIC INSTITUTIONS IN RWANDA:
A CASE OF KICUKIRO DISTRICT**

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A CASE OF KICUKIRO DISTRICT**

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ABSTRACT

The purpose of the study was to evaluate the effect of e-procurement practices on the performance of public institutions in Rwanda using Kicukiro district as a case study. This study was principally completed following the reports that arose referring to lackluster showing of Rwandan public organizations, which was generally been ascribed to insufficient and unseemly running of the public money during acquirement processes. To achieve this, study the following specific objectives that guided the study were; to determine the effect of E-Bidding on performance of public institutions in Rwanda, to examine the effect of E-Tendering on performance of public institutions in Rwanda, to assess the effect of E-sourcing on performance of public institutions in Rwanda and to establish the effect of E-Invoicing on performance of public institutions in Rwanda. The study adopted descriptive survey design. Data was collected through questionnaires. The target population of the study were 93 respondents who are staffs and employees of Kicukiro District because they deal with suppliers' issues in their day operations. Analysis of the data was done using frequency and percentage tables to analyze the demographic information provided regarding the respondents and the organization, mean and standard deviation. The study found that there exist a positive association of e-sourcing to performance of Kicukiro District. This positive association suggests that when one increases, performance of Kicukiro District increases. The study found out that bidding offers a more efficient communication infrastructure with lower transaction costs was agreed at 42.9%, Top management of Kicukiro District always assesses functionality of e-bidding was also agreed at 42.9%, Kicukiro District uses e-bidding components to watch over safety measures and risk was agreed at 39.7%. On E-Tendering practices involved suppliers posting their bids electronically, tender specification and documents sent online, receipt of tender responses electronically, tender notices conveyed to the public electronically and authenticity of bids submitted as represented by means of 3.78, 3.98, 3.92, 4.14, 4.29, 4.43 and 4.50 respectively. Majority of procurement officers agreed to statements that: It helps in achieving low cost in procurement transactions (55.9%); E-sourcing creates value to the organization through innovation (50.0%); It improves communication between the organization and new suppliers (47.1%); It compels the organization to be super-efficient and proactive in their quest to increase return on their investments (47.1%); E-sourcing reduces costs through improved process efficiencies (44.1%). Majority of procurement officers strongly agreed to statements that: Through the reduction in use of papers it offers environmental benefits (44.1%); Compared with traditional paper invoices, the e-invoice can help businesses achieve paperless, transparent transactions (35.3%); It

offers easy retrieval and processing of data (35.3%); It offers greater security of data in the organization (32.4%). The study concluded that E-tendering, E-bidding, E-invoicing and E-sourcing are all statistically significant and influence performance of public institutions. The study findings reveal that majority of the respondents indicated that e-tendering process influences performance of procurement function in the organization to a great extent. Majority of the respondents were neutral as to whether e-auctioning process influences performance of procurement function in the organization. Majority of procurement officers agreed to statements that: E-bidding provide buyers and sellers an open environment. The study recommended that Kicukiro District should use a joint policy in the establishment of similar systems of selecting and issuing tenders as a standard procedure to ensure high levels of performance. Kicukiro District should automate the practice of invoicing so as to promote transparency and record management since it will be easier to track records or identify payments to be made to suppliers.

Keywords: e-Bidding, e-Tendering, e-Sourcing, e-Invoicing, public institution performance, Kicukiro District

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INTRODUCTION

Public Institutions around the world have been using information technology (IT) and the internet to deliver government services and to access information electronically for several years, practices which are commonly referred as e-government initiatives (Asima & Februati, 2014). For some legislatures, one of the more effective and relevant drives is the conveyance of electronic obtainment to upgrade straightforwardness, lay out an open commercial center for acquirement needs, and backing the acquaintance of acquisition changes with better oversee and screen public acquirement exercises (Gelderman *et al.*, 2016). The improvement of electronic obtainment (e-acquirement) frameworks has made various new choices and techniques for supporting the acquisition cycles of state run administrations and for embracing the efficiencies and investment funds that can be understood. These electronic frameworks are regularly known as electronic government obtainment (e-GP) (World Bank, 2013).

Over the past decade, there has been a huge exertion in the public foundations to further develop e-acquirement practice on open organizations systems and methods (Wang, Yan &

Wan, 2016). These endeavors have fundamentally centered in acknowledging further developed proficiency practice and cost-reserve funds through the public organization's framework; by fostering various instruments and devices which help public area bodies in their acquirement exercises. Study directed by (Ahimbisibwe, 2016) express that the manual acquirement rehearses stay the most generally utilized in Africa's public substances. These manual frameworks have a huge contribution on the exchange expenses of sourcing and installment for labor and products and consequently there is a requirement for change with a powerful swing to an e-acquisition framework which can be utilized for improved and quick conveyance of administrations to residents (Asogwa, 2013).

The emergence of the internet as a means of doing business has served as a medium for major changes in the operation and status of organizational procurement. It is evident that ICT has totally transformed the way organizations and governments operate (Basheka *et al.*, 2012). According to Abushaikha (2014) majority of organizational expenses consist of money used to purchase various products and services, and in

order to decrease the total costs spent on purchasing process, internet technologies are used. Consequently, e-procurement has become popular to implement by governments and enterprises alike. Albeit the open doors for development in e-acquisition appear to thrive, both private and public area associations are as yet watched, taking everything into account (Huo *et al.*, 2014).

Most associations are basically utilizing e-obtainment advancements to secure noncore Supplies, including office items, PC and related gear, and support, fix and working costs (MRO). Notwithstanding, Gupta and Narain (2015) demonstrate a reasonable pattern towards coordinating e-acquisition innovations into center business measures as more organizations use them to buy requirements. Bigste (2013) thinks about that e-procurement is essentially those parts of the acquirement work upheld by different types of electronic correspondence. Its utilization in both the general population and private areas takes many structures including: electronic information exchange (EDI), e-MRO (support, fix and activity), Public foundation asset arranging, online public establishment asset arranging, e-sourcing, e-offering, e-invert unloading, e-sell off for removals, e-advising and e-cooperation. Nonetheless, Laryea and Ibem (2016) recommends e-procurements extensively identify with two parts of acquisition: sourcing movement, and value-based buying. E-bidding can thusly be considered as an aggregate term for a scope of advances that can be utilized to mechanize the inward and outer cycles related with sourcing and purchasing.

Rwanda as country with high ambitious development in ICT, through its 7 years' government program from 2017 to 2024 has planned to Strengthen Capacity, Service delivery and Accountability of public Institutions by ensuring that 100% of government services are delivered online by 2024 (Rwanda NST1, 2017-2024). This client guide expresses that acquirement is a purchase and buy which in clear sense isn't. Acquisition has cycles and rules to be continued to

eliminate and limit any unscrupulousness that might emerge in giving out delicate.

To improve acquirement measure in Rwanda, acquisition individuals contemplated e-Procurement. By utilizing the web-based framework, the Government buys products, works, administrations and non-consultancy administrations to assist the Government to guarantee productivity of public obtainment with the normalization of electronic archives, provider enlistment, labor and products data and to smooth out open acquisition. Today's, 90% of public procuring entities (Districts and all government entities) are using public e-Procurement system (Umucyo system) in their procurement process (RPPA-Annual Report 2019-2020). The Umucyo e-procurement is being used as a single channel, portal and point of access for Rwanda impact on the compliance of procurement principles and performance of public institutions in Rwanda (Harelimana, 2018).

Rwandan Districts adopted e-procurement for modernizing the way procurement functions process is ensured. Rural Rwandan Districts are not well advanced in use of online or IT as a tool for services delivery due to more challenges such as access to stable network, insufficient training on services delivery using IT and insufficient of supporting materials due to the insufficient logistics budget (Osoro, 2018). Due to that, auditors general in different years has blamed districts delays in procurement services and raise of conflict associated between district and procurement stakeholders (Kicukiro District report, 2018). Due to that, this study intends for assessing the influence of information technology practices in procurement on organization performance in public institutions in Rwanda, a case of Kicukiro district (2016-2020).

This examination concerning e-acquisition practices and execution on open organizations situated in what might be alluded to as more created economies apparently proceeds to develop and develop, the vast majority of the current writing including less created nations is moderately

youthful, speculative and still needs solid hypothetical clarifications for constraints of training by e-obtainment in establishments. The motivation behind this review is to inspect the effect of e-obtainment rehearses on establishment execution, the appraisal of e-acquirement and dealing with the difficulties to the e-acquisition rehearses in organization's Rwanda's. In doing as such, this exploration come up a commitment to a space of concentrate obviously needing extra examination (Ahimbisibwe, 2016).

This study examined the relationship between e-procurement and performance to fundamental principles governing public procurement for local public procuring entities in Rwanda; it takes a case of Kicukiro district. E- Procurement was conceived as the independent variable while Consistence to key standards overseeing public acquirement is conceived as the dependent variable. E-Government procurement was measured in terms of key modules of Umucyo e-Procurement system in Rwanda. Consistence to key standards overseeing public acquirement was measured in terms of key measurable benefits of e-Government procurement to ensure transparency, competition, effectiveness and efficiency, economy and accountability in public process (Government of Rwanda, Article 6 of the law N^o 62/2018).

According to Rwanda Law Governing Public Procurement No 62/2018 of 25/08/2018; after the approval of the State Finance Law, the procuring entity prepares and submits to the Ministry and Rwanda Public Procurement Authority the annual procurement plan indicating activities to be done that requires tendering process and their related budget. Procurement planning is a requirement under the Rwandan public procurement laws and regulations. An annual procurement plan is also the first step in the procurement planning process. Ideally, the relationship that procurement officers have with user and budget departments should be so close that they are involved at an early stage of the budget cycle, where departments are

identifying their needs in the respective budget year.

Public institutions spend a lot of francs on procurement, which refers to all of the activities required to get good, works or service from a supplier to the user. The activities encompass the purchasing function, storing, transportation and management of the relationships between suppliers and internal customers (Bryntse, 2016). According to Agaba and Shipman (2017); E-procurement is the process used by companies or public institutions to prepare purchasing activity for a specific period of time. This is completed during the budgeting process. Each year, institutions need to budget for staff, expenses, and purchases. This is the first step when preparing procurement plan. When procurement plan is not done accurately, the performance will also be affected hence affecting the best achievement of value for money. A good procurement planning is done by describing the process through to appoint suppliers contractually. Whether you are embarking on a project procurement or organizational procurement planning exercise, procedures are the same. First, describe the items you need to procure, describe the process for acquiring those items and finally, plan the timeframes for getting goods (Agaba & Shipman, 2017).

Kicukiro District as one of procuring entity must produce an annual procurement plan indicating the objectives to be achieved in accordance with the procurement regulations. The preparation and approval of procurement plan should correspond to the budget definitively adopted by the relevant organ. While getting ready acquisition plan, Institutions should guarantee that there is adequate spending plan portion and should conform to guidelines overseeing financial plan execution. Nonetheless, regardless of whether the law requires thus, securing elements actually grants spontaneous. Ngendahimana (2014) recommends that since public institutions spend a lot of money on procurement proceedings; a lot of emphasis or attention needs to be given to the procurement

planning to enable companies achieve best optimal cost structures. Rwiwera (2014) who carried out a study on key execution estimation inside an activities procedure setting, recommended that organizations striving to succeed especially the small-scale firms have a leaf to borrow from the successful companies. However, there is little evidence of any study carried out to investigate performance in the area of procurement planning, which can be borrowed by such public institution. Therefore; the researcher intends to fill the gap by investigating the effect of E-procurement practices on performance of public institutions in Rwanda. A case study of Kicukiro district.

Statement of the Problem

E-procurement in public institutions is one of the primary functions or technology of procurement with a potential to contribute to the success of public institution's market operations and increasing service delivery (Halerimana, 2018). It is a capacity that gets rolling the whole obtaining/acquisition interaction of public establishments. Regardless significance-procurement and performance of public institutions in Rwanda, research has been done to look at the degree to which sway in e-acquirement can add to viable establishment's presentation (Government of Rwanda, DCD/DAC, 2003). Public organization that utilizations state assets for its tasks should conform to the Public Procurement Act or public Principles. Issue gives the execution of the Public E-Procurement Act is extremely critical and are on low level to these foundations since debasement, regionalism, some staff or representatives contend personal circumstance.

With the automation of procurement process, it seems that the electronic procurement improves the flexibility and instant access to the information related to the tenders, many issues related to transparency, economy, efficient, were minimized. Poor performance of public institutions has mostly been attributed to ineffective and inappropriate running of the public finance during procurement processes. It is therefore a good time to be aware of

the necessity to give value for money and to effectively implement performance on all levels of the public sector during procurement process to eradicate the cases of speculative performance and achieve sustainable performance. Providing information on the performance of the public sector the public's need to know is satisfied and can also can be a useful tool for government in order to assess their own achievements (Public Account Committee, 2014). In addition, MINECOFIN reports emerged citing poor performance of the ministry which was mostly been attributed to ineffective and inappropriate running of the public finance during procurement processes. The ministry used a lot of sums of money between 2013, 2014 and 2015 worth 20.4 million, 23.2 million and 24.4 million respectively.

For fiscal year 2018-2019, in city of Kigali, tender entitled: Hiring a Consultant Firm for Feasibility study to upgrade informal settlement Mpazi catchment, the request for proposal (RFP) was publishing without requesting the expression of interest for tender with estimated budget which is more than 50 million as per the law of public procurement and regulations (OAG, 2020).

Even if the e-procurement has been introduced and operationalized in all procuring entities, some of them are not complying 100% with the principles governing public procurement. According to findings of RPPA as reflected in their Annual Activity Reports, there are several non-compliance in the procurement process and contract implementation identified in the past which among others, includes lack of clear technical specifications, lengthy bidding process, utilization of biased rules for open tenders, unfortunate record keeping, unnecessary postpones in agreement execution and goal of issues with project workers.

As per the Auditor General's Report ending June 30, 2018, there were persistent cases of delayed and abandoned contracts. This may be caused by different factors such as use of discriminatory criteria in the tender document when selecting suppliers, unfair evaluation for the bidders and

awarding the tender to the incompetent contractor, lack of advanced infrastructures as internet connection is not available in all areas of country.

Following the principles governing public procurement in Rwanda, the Umucyo e-procurement system have not yet strengthened the compliance to them; easy accessibility of information should have increased the level of competition but when the PEs used discriminative criteria in the selection of supplier/contractor, this limits the level of competition and hinder the transparency and economy. Even though the public sector management has much pressure to attain transparency, effectiveness and efficiency in delivery of excellent services there is big challenge as the method of paper working still used for contract management purpose, which hinders the effective, efficient and fast work principle as said above (Abiola & Asiweh, 2012). It is from the above research problems where the researcher is prompted to find out the relationship between e-government procurement and the compliance to the fundamental principles governing public procurement in Rwanda.

LITERATURE REVIEW

The Principal – Agent Theory

The principal –agent model explains the kind of relationship that subsists between the principal and his agent in which the former is always in a stronger position to persuade the latter to perform certain functions that best meet the principal's interests (Boyd & Gupta, 2014). In this theory, the relationship between the principals such as company shareholders and agents or company executives and managers is clearly defined. According to the theory, owners of the company (shareholders) employ staff (agents) to perform some tasks on their behalf. The day to day running of the business is delegated to the managers by the principals. In this relationship, managers are actually the shareholders' agents (Clarke, 2014).

In view of the head - specialist hypothesis, acquisition administrators and all open authorities

engaged with public obtainment exercises should play the specialist job for chose delegates. This is exceptionally evident in Tanzania where the Public Procurement Act gives the obligation of consistence with public acquirement legitimate structure on the Accounting Officers of the getting substances. In any case, as brought up by Langevoort (2012), consistence with obtainment rules and guidelines might address a head - specialist issue.

Experience has shown that application of the agency model poses a number of challenges that make the opponents to increasingly question on its credibility. Opponents argue that there is always a difference between the directions given by the principals and the actual decisions made by agents. This divergence between the principal's decision and the agent's decisions is the main problem highlighted by the agency model. The divergence arises due to the fact that the agents also have their self-interests that they would like to maximize in the course of discharging the given responsibilities. And if the agent works for the sole benefit of the principal, he/she is demotivated and thus likely to engage in lower level of effort.

From this theory it is inferred that when someone is forced to comply, dissonance is created. Forced public procurement compliance can therefore result in cognitive dissonance (Tukamuhabwa, 2012). However, proponents of this theory argue for the need to increase public participation in the procurement process. The argument here is that increased public participation in the procurement process is likely to strengthen the scope of monitoring and enforcement of procurement decisions by public agents and shift the responsibility from the elected representatives to the taxpayers, who are the main principals.

The Principal – Agent theory was therefore relevant and useful in our study in that it assisted the researcher in explaining the relationship between the government as the principal and the procuring entities as agents in the implementation of the public procurement legal framework. The hypothesis shows how the activities and execution

of the getting substances (as the specialist) influence the public authority (as the head) and different partners (Muranda, 2016). In particular, the actual implementation of the public procurement law and regulations was discussed through this theory.

Conceptual Framework

The conceptual framework illustrates the relationship between the independent variables and the dependent variables. The relationship between e-procurement implementation and

organizational performance can be conceptualized at a fairly general level in figure 1 below as a two-stage relationship. Successful and complete e-procurement implementation evidenced by the six forms of e-procurement showing the extent of implementation and the impact on a series of intermediate factors of procurement key performance indicators (KPI), which in turn determine organizational performance. The model presents the five dimensions impact on organizational performance by e-procurement implementation as developed by Gardenal (2013).

Independent Variable: E-Procurement practices

Dependent Variable: Performance of public institutions

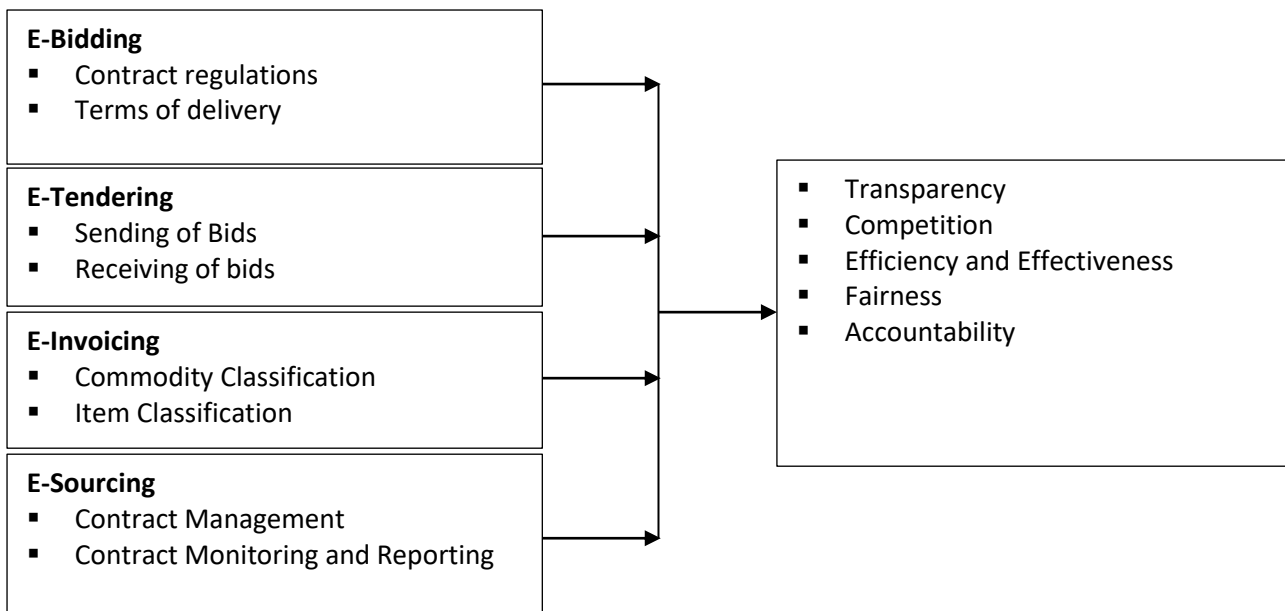


Figure 1: Conceptual Framework

Source: Researcher, 2020

METHODOLOGY

This study adopted a triangulation research designs. In collecting quantitative data, the survey method was employed by the use of structured questionnaires. The choice of this approach was twofold; first it is capable of yielding quantitative information that can be summarized through statistical analyses and secondly, the survey method is an effective tool for getting cause- and- effect relationships and hence is the most frequently used in almost all disciplines (Cooper & Schindler, 2013).

In this manner, the specialist considered a study technique a helpful plan in obliging the fluctuation related with the different idea of the respondents and the obtainment exercises they are taken part in. For subjective information, the meeting guide was utilized to gather inside and out data that enhanced information got from the surveys. This top to bottom data gave the analyst itemized knowledge on what really decides the presentation of obtainment divisions in open elements in Rwanda.

Study Population: A population is defined as a complete set of individual cases or objects with some common observable characteristics (Mugenda & Mugenda, 2012). A particular population has

some characteristics that differentiate it from other populations. The population of this research is 93 (staff of whole Kicukiro district).

Table 1: Target population

Target population category	Population under study
District staff	73
Procurement officers and staff	20
Total	93

Source: Researcher (2021)

The researcher chose a population of staffs and employees of Kicukiro District because they deal with suppliers' issues in their day operations.

Sampling: Sampling frame is a list of all the population subjects that the researcher targeted during the study (Cooper & Schindler, 2008). The study sampling frame is the list of the study target population, from where the study selected the sample size (Kothari, 2014). A sampling frame is the list of elements from which the sample is actually drawn (Ngechu, 2012). The sampling frame was obtained from list of procurement officers and staff in the procurement departments.

Sample design: Creswell (2014) defines a sample as a subset or portion of the total population under study. This part concerns the sample size and sampling procedures used to come up with the sample size. In practice, the sample size used in a study is determined based on the expense of data collection, and the need to have sufficient statistical power. According to Neuman and Robson (2014) sampling is the process of selecting elements from the total population. A sample size is respondents defined as definite part of statistical population whose properties are studied to gain information about the case of study. It is not potential to collect data from the whole population due to the time and financial constraints.

Sampling techniques: The choice of sampling technique is based on the feasibility and sensibility of collecting data to answer the research questions and to address the objectives. Quantitative research usually ensure sample representativeness using

scientific, statistical and probabilities or random sampling as quantitative research therefore. The sampling method chosen for this study was purposive sampling which is a form of non-probability sampling. Purposive sampling involves a deliberate selection of particular units of population to constitute a sample representing the population (Kothari, 2014).

Data Collection Methods and Tools: Both primary and secondary data tools were used under this study.

Primary data source: Primary data was collected using questionnaires and interview guide. Both open and closed ended questionnaires were used to let the respondents give their own opinion about the study. Primary data was collected at the first hand when the researcher went to the field to collect raw data from District of Kicukiro employees.

Secondary data Source: Secondary data was collected by use of document analysis that were obtained from literature sources or data collected by other sources. Secondary data was collected from literature, Internet sources and accessible study materials of the case study.

Validity and reliability of the research instruments: To measure validity of research, instrument the researcher used expert judgment; this was relying on groups of individuals with specialist skill set, training or experience in the subject matter relevant to the activity being performed.

The researcher enhanced the reliability of the data collected by ensuring that the questionnaires were pre-tested before being administered to the sample group. The instrument was piloted using 8 management staff of who were part of the sample before they are administered. From the piloted instruments, reliability was determined. Data reliability, which is a measure of internal consistency and average correlation, was measured using Cronbach's alpha coefficient that ranges between zero and one (Kothari & Gaurav, 2014). Higher alpha coefficient values mean there is consistency among the items in measuring the concept of interest. As a rule of thumb acceptable alpha should be at least 0.60 and above (Kombo & Tromp, 2016).

Data processing: The data collection techniques that were employed for the research included the use of open and closed-ended questionnaires for selected staffs and employees of Kicukiro District. A questionnaire is defined as a formalized schedule or form which contains an assembly of carefully formulated questions for information gathering as noted by (Sekaran, 2017). The variables on the key objectives of the study were measured in interval scales on a five-point Likert scale (1-representing strongly agree to 5– strongly disagree) to determine respondents' agreement with the concepts under investigation. Data was processed using the SPSS version 21.

Data Analysis: To ensure easy analysis, the questionnaires was coded according to each variable of the study. This study used descriptive and inferential statistics. According to Sekaran and Bougie (2015) descriptive analysis involves a process of transforming a mass of raw data into tables, charts, with frequency distribution and percentages, which are a vital part of making sense of the data. In this study, the descriptive statistics such as percentages and frequency distribution were used to analyze the demographic profile of the participants.

The study was based on a multiple regression model. Analysis was based on dependent, independent and error term. SPSS version 21 software was used to analyze the data collected and to provide a sufficient conclusion. The test and correlation study was carried out to determine if there existed a significant relationship between the variables and to test whether there was a relationship amongst the independent variables.

A multiple regression model that was used in this study is shown below:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where

Y= Dependent variable – Institution Performance, α = Constant, μ = Error, β = Coefficients, X_1 = E-Bidding, X_2 = E-tendering, X_3 = E-invoicing, X_4 = E-Sourcing

In this case: Institution Performance = F (e-bidding, e-Tendering, e-Invoicing, e-Sourcing).

The significance of the analytical model was tested using ANOVA statistical model which is the Analysis of Variance. A regression analysis was done to find out the relationship between e-procurement and institution performance.

FINDINGS

The study determined the relationship between e-procurement and performance of public institutions in Kicukiro District. Respondents were asked to give responses on a Likert Scale of 1-5 where; 1 = very small extent; 2= small extent; 3= moderate extent; 4= large extent; and 5= very large extent. Analysis was done and results are as shown in Table 2.

Table 2: Respondents' level of agreement on -Procurement and Procurement Performance

Statements	1	2	3	4	5	Mean	Std. Dev
By using e-procurement in our institution there has been reduction of errors in order transmission	0%	6.3%	9.5%	41.3%	42.9%	4.21	0.86
Adopting e-procurement in our institution there has been reduced work content in the total "requisition to payment" process	0%	4.8%	12.7%	23.8%	58.7%	4.37	0.89
There are significant reductions in the time taken to complete the procurement process	0%	0%	15.9%	25.4%	58.7%	4.43	0.76
By using e-procurement in our institution there has been reductions in inventory wastage	0%	14.3%	33.3%	31.7%	20.6%	3.59	0.98
Delivery of best-value contracted goods and service when our institution has adopted e-procurement	0%	3.2%	20.6%	25.4%	50.8%	4.23	0.89
Our institution transaction costs has been greatly reduced	4.8%	3.2%	4.8%	20.6%	66.7%	4.41	1.06

Source: Primary data, 2022

Findings in Table 2 indicate that majority of public institution in Kicukiro District using e-procurement in our institution there has been reduction of errors in order transmission as indicated by a mean of 4.21. Adopting e-procurement in our institution there has been reduced work content in the total "requisition to payment" process respondents agreed with a mean of 4.37. Majority indicated that there are significant reductions in the time taken to complete the procurement process as indicated by a mean of 4.43. By using e-procurement in our institution there has been reductions in inventory

wastage minority agreed as shown by a mean of 3.59. Majority agreed that delivery of best-value contracted goods and service when our institution has adopted e-procurement as indicated by a mean of 4.23. Lastly, majority agreed that public institution transaction costs has been greatly reduced as indicated by a mean of 4.41.

Regression Analysis

Regression analysis was done to examine the effect of e-procurement practices on performance of public institutions in Rwanda. A case study of Kicukiro district.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.942 ^a	.894	.868	.130

a. Predictors: (Constant), e-Bidding, e-Tendering, e-Sourcing, e-Invoicing

Table 3 shows that the coefficient of determination R square is 0.894 and R is 0.942 at 0.05 significant level. The coefficient of determination indicates that 89.4% of the variation in the dependent

variable public institution performance is explained by the independent variables (e-Bidding, e-Tendering, e-Sourcing, e-Invoicing).

Table 4 ANOVA^a

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.575 ^a	3	.192	11.388	.000 ^b
	Residual	1.379	82	.017		
	Total	1.953	85			

a. Dependent Variable: Public institution performance

b. Predictors: (Constant), e-Bidding, e-Tendering, e-Sourcing, e-Invoicing

Table 4 presents the results of Analysis of Variance (ANOVA) on e-procurement practices of Public institution in Kicukiro District in Rwanda. The ANOVA results for regression coefficient indicate that the significance of the F is 0.00 which is less than 0.05. This implies that there is a positive

significant relationship between e-procurement practices and public institution performance in Kicukiro District in Rwanda and that the model is a good fit for the data. Therefore, the study rejects the null hypothesis accepting the alternative hypothesis.

Table 5: Coefficient results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.455	.231		1.973	.106
	e-Bidding	.162	.009	.444	1.815	.009
	e-Tendering	.187	.050	1.231	3.616	.036
	e-Sourcing	.158	.017	1.075	3.159	.025
	e-Invoicing	.205	.240	.230	.850	.028

From the data in the above table the established regression equation was

$$Y = 0.455 + 0.162 X_1 + 0.187 X_2 + 0.158 X_3 + 0.205 X_4$$

From the above regression equation, it was revealed that holding e-Bidding, e-Tendering, e-Sourcing and e-Invoicing to a constant zero, performance of public institutions in Rwanda would be at 0.455. A unit increase on e-Bidding would lead to increase in performance of public institutions in Rwanda by a factor of 0.162, a unit increase in, e-Tendering would lead to increase in performance of public institutions in Rwanda by a factor of 0.187, a unit increase in e-Sourcing would lead to increase in performance of public institutions in Rwanda by a factor of 0.158 and unit increase in e-Invoicing would lead to increase in performance of public institutions in Rwanda by a factor of 0.205.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that e-Bidding, e-Tendering, e-Sourcing and e-Invoicing are statistically significant and influences performance of public institutions in Rwanda.

The first objective of the study was to determine the effect of E-Bidding on performance of public institutions in Rwanda. A case study of Kicukiro district. With regard to E-Bidding, the study concludes that there is increased competitiveness in

the tendering bid for Kicukiro District and was interpreted to mean that; the district has put in place electronically enabled procurement systems that allow individuals to bid for any amount of tender they find suitable and in line with their profession or qualifications; most of the departments in the area have free and fair bidding processes that allow those who qualify to receive a tender to apply with assurance; there are less condition put on bids and the availability of information for suppliers is readily available either through online or directly from the government website; and finally the district management has supplier friendly ICT systems that allow applicants for tendering projects to easily access information with less knowledge or skills required to operate the site where tenders and availed. Based on E-Bidding, the main finding of the study was that the adoption of E-Bidding is able to indicate charges from purchasers to suppliers and was interpreted to mean that majority of the Rwanda procurement conduct operations based on information regarding the tenders that the agencies conduct.

The second objective of the study was to examine the effect of E-Tendering on performance of public institutions in Rwanda. A case study of Kicukiro district. The study concluded that among other factors that might have an effect on organizational performance major focus should be paid on e-

tendering, e-auctioning, e-purchasing and e-invoicing so as an organization or institution can have greater organizational performance. On the basis of the afore-mentioned findings, the following deductions are expedient: The correlation and linear regression analysis employed for testing the two hypotheses revealed that; e- procurement has a significant effect on the organizational performance in Kicukiro District and that there is a positive and significant relationship between e-procurement and organizational performance. Generally, these findings have a lot of implications on the entire Kicukiro district at large, because if the agencies are doing well at the micro level due to e- procurement, then general district level too would be influenced positively.

The third objective of the study was to assess the effect of E-sourcing on performance of public institutions in Rwanda. A case study of Kicukiro district. It is concluded that using e-sourcing in Kicukiro district has a positive and significant effect on the performance of the agencies. It is also noted that e sourcing influences the performance as it enhances effective selection of suppliers from a wider region and hence enhancing effective competitiveness in the process. The study also concludes that by using e – tendering the firms’ performance is likely to be enhanced because through e – tendering the Kicukiro district are able to process the tenders fast and efficiently hence this will boost their performance. The study also concludes that the use of e- payment plays an important role in the enhancing the performance of the public institutions in Rwanda s, it was revealed that the by using e-payment the procedures involved are reduced making the entire process very efficient and hence improved performance. The study also concludes that since there is a strong positive correlation between e- archiving/ record keeping and performance of public institutions in Rwanda then e- procurement is seen to play a significant role in the performance of public institutions in Rwanda. majority of procurement officers agreed to statements that: It helps in

achieving low cost in procurement transactions (55.9%); E-sourcing creates value to the organization through innovation (50.0%); It improves communication between the organization and new suppliers (47.1%); It compels the organization to be super-efficient and proactive in their quest to increase return on their investments (47.1%); E-sourcing reduces costs through improved process efficiencies (44.1%); It facilitates tracking procurement transactions and ensures quality supplies (41.2%); and Through the process of e-sourcing there has been timely delivery of goods and services to user departments (38.2%) are statements regarding e-sourcing process and performance of Kicukiro district.

The fourth objective of the study was to establish the effect of E-Invoicing on performance of public institutions in Rwanda. A case study of Kicukiro district. With respect to e-invoicing, the main finding of the study was that e-payment makes it cheap to promptly pay suppliers on supply delivery due to fewer charges incurred upon sending money through e-banking systems. The main finding of the study was then interpreted to mean that the development of IT has enhanced the usage of e-payment and improved the use of supply chain management; that the complete implementation of the website usage has to a large extend integrated, much more effective supply chains with full information transparency and optimal allocation of value-adding processes; and that the hospitals that have full operational e- procurement systems are able to follow up the stages of procurement to determine the payments to be made and thus a transparent system reduces the cost of operation which has been flooded with corruption in the past when the hospital was using manual methods.

On the basis of the above conclusions, the following recommendations are made for the effect of e-procurement on performance of public institutions in Rwanda.

The first objective of the study was to determine the effect of E-Bidding on performance of public institutions in Rwanda. A case study of Kicukiro

district. Proper application of e-bidding brings instant impact on the winning price. From the viewpoint of efficiency an important factor to consider is the increased number of bidders attracted by the clear advantage that electronic bids have with respect to transparency, which leads to increased trust. As e-auctions strive to bring direct benefits, it is also necessary to boost skills and qualifications of procurement staff in general and tendering staff in particular. This will not only increase efficiency, transparency and credibility in tendering procedures but also decrease the level of passive waste. The above measures can thus bring significant savings in procurement expenses of Kicukiro district.

The second objective of the study was to examine the effect of E-Tendering on performance of public institutions in Rwanda. A case study of Kicukiro district. The study recommends Kicukiro district should use a joint policy in the establishment of similar systems of selecting and issuing tenders as a standard procedure to ensure high levels of performance. This will enable the Kicukiro district to purchase the right items from the best suppliers filtered through stiff competition among the suppliers. The agencies should in turn provide the suppliers with access credentials for the supplier portal. In the end, this will increase user access to e-procurement resulting in increased chances of selecting the best supplier for e-tendering. E-procurement process should be specific and accurate with respect to requisition, tendering, contracting and invoice payment. The goal of e-procurement in the Kicukiro district should be to enhance the quality-of-service delivery to stakeholders by providing timely, transparent and accurate financial information to all users. All respondents agreed that E-Tendering practices involved suppliers posting their bids electronically, tender specification and documents sent online, receipt of tender responses electronically, tender notices conveyed to the public electronically, Short listing of tenders is done by the e-procurement system, limits the incidence of collusion between

bidders relative to traditional tendering because they fear detection and maintain the integrity, confidentiality, and authenticity of bids submitted as represented by means of 3.78, 3.98, 3.92, 4.14, 4.29, 4.43 and 4.50 respectively.

The third objective of the study was to assess the effect of E-sourcing on performance of public institutions in Rwanda. A case study of Kicukiro district. It is also recommended that Kicukiro district should adopt the use of e-sourcing to enable them expand sourcing scope and hence attract more competent people to offer them effective, efficient and competitive services. Conversely, failure to adopt e-sourcing could adversely impact on their performance. It has been demonstrated that firms that seek to enhance their performance must ensure that they embrace e-procurement in its entirety as this facilitates the coordination and processing of various activities leading to higher performance and profitability.

The fourth objective of the study was to establish the effect of E-Invoicing on performance of public institutions in Rwanda. A case study of Kicukiro district. The study recommends that Kicukiro district should automate the practice of invoicing so as to promote transparency and record management since it will be easier to track records or identify payments to be made to suppliers. E-invoicing should therefore benefit the agencies by enhancing their financial controls and improved accounting, recording and reporting procedures.

Areas for further research

The study evaluated evaluate the effect of e-procurement practices on performance of public institutions in Rwanda. A case study of Kicukiro district. Further researchers are suggested to increase on the sample size and techniques in order to obtain a more representative of the population. The researchers are also recommended to carry out studies on: The impact of internal auditing on the performance in public institutions in Rwanda, Effects of promotion on the performance of public institutions in Rwanda.

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