

Effects of e-Procurement Practices and Procurement Performance in Governance Institutions of Rwanda.

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Abstract

With the emergence of Information and Communication Technology (ICT), public institutions, governance institutions, government entities and business companies have been compelled to shift their operations from their traditional style to eBusiness, eProcurement and eSupply Chain philosophies in order to sustain themselves. This can be achieved through efficiency delivery and value for money within the public funds. Yet, in today's dynamic global competitive business, web-based service is no longer an afterthought, rather it is a must and crucial for public, governance, and private organizations. In addition to this, it is since the arrival of the web-based technologies in the scene as a supply chain management tool in mid-1990s that public institutions, government entities, and business enterprises tried to gain the benefits eProcurement can deliver such as reduced administrative costs, streamlined procurement procedures, faster procurement procedures, increased transparency and efficiency, better monitoring of procurement, encouraging cross border competition, supporting the development of centralized procurement administration, wider administrative modernization and simplification, cycle time reduction, budget control and reporting, increasing visibility of supply chain, better inventory management, and many more. It is due to these backgrounds that this dissertation took on ascertaining the effects of eProcurement Practices and Procurement Performance in Governance Institutions of Rwanda. The dissertation used a mixed method research approach and correlation to describe the effects of eProcurement Practices and Procurement Performance. The results showed a significant effect of eProcurement practices and Procurement Performance in Governance Institutions of Rwanda.

Key Words: Procurement, Procurement performance, eProcurement, e-Informing, e-Sourcing, e-Tendering, e-Ordering, eProcurement practices.

1.0. Introduction and Background of the Study

In the world of procurement, the advent of web-based electronic procurement has been shown as a key indicator to effective procurement due to its potential to reduce the total cost of acquisition (*Rai et al., 2006*). Keeping the procurement process simple and cost efficient is a major challenge that every government faces (*Pattanayak & Punyatoya, 2020*). Thru the emergence of technology, government entities and business companies have been forced to shift their operations from the traditional style to eBusiness, eProcurement and eSupply Chain philosophies to sustain themselves.

The web based technology's impact has added value and speed to all activities and avenues of business in today's dynamic global competition. The ability to provide customers with cost effective total solution and life cycle costs for sustainable value has become cheerful. Business organizations are now under remarkable burden to improve their openness and efficiency in matters of product development, operations and resource utilization with transparency. With the emergence of web-based electronic procurement, public and governance institutions, service organisations, business companies are compelled to shift their operations from traditional way of paper-based to an automated one (*Carabello, 2007*).

Procurement is defined as a process in which governments, service organizations and business companies establish agreements for the acquisition of works, goods or services (contracting) or purchase works, goods or services in exchange for payment, frequently through competitive bidding procedures (purchasing) (*Robinson, Wale & Dickson, 2010; Rolstadas, Hetland, Jergeas & Westeney, 2011*). eProcurement is in its turn the use of web based technology in the traditional procurement process (*Abu-Elsamen, Chakraborty & Werren, 2010; Garrido, Gutierrez, & Jose, 2008; Gunasekaran & Ngai, 2008; Muffato & Payaro, 2004*). eProcurement enables companies to trim down business costs (*Gunasekaran & Ngai, 2008*), to reduce purchasing time (*Lefebvre, Lefebvre, Elia & Boeck, 2005*), to streamline purchasing processes (*Teo, Lin & Lai, 2009*), and to access wider markets (*Gunasekaran, McGaughey, Ngai & Rai, 2009*).

At its simplest, eProcurement is a catch-all term for the replacement of paper-based procedures with information technology-based communications and processing throughout the procurement process. It can be a tool to make process more efficient and promote the effectiveness of procurement. The web-based electronic procurement and processes can be used, where appropriate, at different phases of procurement process, including publication of tender notices, the provision of tender documents, submission (publication) of tenders, evaluation process, notification of award, contract negotiation, contract signing, and contract management.

Rwanda like many countries in Africa focused on eProcurement to mitigate the problems which have been raised due to traditional method used in procurement. By July 2016, the government was ready to pilot the new system with a few selected government ministries, agencies, and districts. The eight entities chosen were the Ministry of Finance and Economic Planning (MINECOFIN), the Ministry of Infrastructure (MININFRA), the Ministry of Health (MINISANTE), Rwanda Development Board (RDB),

Rwanda Transport Development Agency (RTDA), Rwanda Biomedical Centre (RBC), Gasabo and Kicukiro Districts.

1.1. Problem Statement of the Study

Each and every public procurement in a country aims at delivering efficiency to meet its procurement principles such as transparency, accountability, competition, economy, value for money, openness and fairness. However, it must adhere to the regulations and chunks stipulated in the national procurement regulations and policies. The competency of the purchasing unit in its operations performing its duties expertly as specified as per the budget is used to measure the procurement efficiency (Graham & Melvyn, 2011). The principle of a country's procurement system is to deliver efficiency and value for money to its population whilst adhering to requirements outlined in national procurement laws and policies.

Whereas developed countries such as Japan, United Kingdom (UK), Australia, United States of America (USA), Singapore and others are now reaping the benefits because they have effectively deployed eProcurement systems. In Rwanda, eProcurement system has not always been used, rather they have used tradition procurement method, but within the enhancement of using technology in the country, Rwanda embarked on using of eProcurement system to trim down all associated procurement costs and procurement cycle time, to increase efficiency and to trim down risks associated with procurement in their daily activities, and this effort of using eProcurement system may lead to effective procurement. It is in this regard that public and governance institutions, service organizations tried to introduce eProcurement to strive for transparency, competition, accountability, efficiency, effectiveness, economy, openness and fairness (JAmukhobe, 2018).

Even though there are various studies conducted on eProcurement adoption (the existence of eProcurement use, rather than as the process leading to use) and as well as factors influencing its adoption, others attempting to explore the effects of eProcurement practices usage. Still, there is a scarcity of literature review from previous empirical studies and scholarly works in matter of eProcurement effect and procurement effectiveness. This for instance is the case of Viadya & Guy, 2006; Gunasekaran, *et al.*, (2009); Matunga, 2013; Orina, 2013; Croom & Brandon, (2004), and many more others.

Mutaga *et al.*, (2013) on the effect of eProcurement practices on effective procurement in public hospitals in Kenya revealed that public hospitals have adopted some of the eProcurement applications regardless of the challenges that accompany the adoption. Orina (2013) on eProcurement readiness factors in Kenya's Public sector, affirmed resistance to change, lack of enthusiasm, staff skills, and procurement policies affect the readiness of eProcurement in public institutions.

In their research on the impact of eProcurement adoption in the UK public sector, Croom. S & Brandon Johns. A., (2004) tried to highlight some benefits of eProcurement use in public sector such as reduced search costs, increased supply availability, improvement in communication, leverage power, reduced purchasing processes, reduced maverick purchasing, etc.

Gunasekaran, *et al.*, (2009) on eProcurement adoption in the South coast SMEs revealed a substantial number of those SMEs appreciate the effect of eProcurement use but failed to blend on its effect in matters of procurement effectiveness and efficiency.

From these predetermined discussions, it is clear that, despite the relevance of eProcurement as a key strategy to procurement efficiency and effectiveness, there is a scarce literature from previous empirical studies. Hence, it is due to these backgrounds that this dissertation took on ascertaining the effects of eProcurement Practices and Procurement Performance in Governance Institutions of Rwanda.

1.2. The General Objective of the Study

The all-purpose of the study was to ascertain the Effects of eProcurement Practices and Procurement Performance in Governance Institutions of Rwanda with a focus on the Ministry of Finance and Economic Planning.

1.3. The Specific Objectives of the Study

1. To assess the effect of e-Informing on procurement performance in government institutions of Rwanda.
2. To find out the effect of e-Tendering on procurement performance in government institutions of Rwanda.
3. To determine the effect of e-Sourcing on procurement performance in government institutions of Rwanda.
4. To ascertain the effect of e-Ordering on procurement performance in government institutions of Rwanda.

1.4. Research hypotheses

The following hypotheses were formulated to guide the pollster to conduct this research work:

Ho₁: e-Informing has no significant effect on procurement performance in governance institutions of Rwanda.

Ho₂: e-Tendering has no significant effect on procurement performance in governance institutions of Rwanda.

Ho₃: e-Sourcing has no significant effect on procurement performance in governance institutions of Rwanda.

Ho₄: e-Ordering has no significant effect on procurement performance in governance institutions of Rwanda.

2. Literature Review

2.1. Theoretical Literature Review

Theories are explanations of a natural or social behavior, event, or phenomenon. They play a vital role in a research. In a research work, theories provide a causal logic of the occurrence of natural or social phenomenon by explaining what are the key drivers and key outcomes of the targeted phenomenon and why, and what underlying processes are responsible driving to that phenomenon. Theories facilitate in sense making by helping us synthesize prior empirical finds within a theoretical framework and reconcile contradictory findings by discovering reliant factors influencing the relationship between two constructs in different studies. Research work without theories is less emphatic to establish the relationship among attributes, variables or data. In this sense, theories provide guidance for future

research by helping identify constructs and relationships that are worthy of further research. On the other hand, theories and research together lay the foundation for practice. Theories help to link the abstract and concrete which ultimately results in relevant and research application oriented practice. Innovation Diffusion Theory, Disruptive Innovation Theory, and Technology Acceptance Theory were used in this research work as a mean of providing a theoretical framework for the investigation.

2.1.1. Innovation Diffusion Theory

Innovation Diffusion Theory is a seminal theory in the communications literature that explains how innovations are adopted within a population of potential adopters. The concept was first studied by French sociologist Gabriel Tarde, but the theory itself was developed by Everett Rogers in 1962 based on observations of 508 diffusion studies. According to Rogers (1998), Innovation Diffusion Theory incorporates four key elements. The first is innovation which emphasizes on the ability to find better and more efficient ways of working. Innovations may include new technologies, new practices, or new ideas, and adopters may be individuals or organizations. The second element is the communication channels wherein the information passes through either for information storage or information creation. The third element is the time which takes in account the length of time involved in the innovation decision process. The fourth element is the social context of the new systems where people in a social system learn about a new innovation and its potential benefits through communication channels and are persuaded to adopt it. Rogers (1962) affirmed that the Innovation Diffusion Theory classifies adopters of innovation into five categories namely innovators, early adopters, early majority, late majority and laggards. To sum up, innovation is all about the scientific, technological, organizational, financial, and commercial activities necessary to generate, put into practice, and market new processes.

2.1.2. Disruptive Innovation Theory

Coined in the early 1990s by Harvard Business Professor Clayton Christensen and debated by Barahona and Elizondo (2012). The theory points out that eProcurement is an innovation and, as such, calls for continuous improvement and management. It is regarded as the most influential innovation theory in business theory in the early 21st century. Although the theory involves a lot of content, its core content need to meet four basic criteria such as looking customers in a new way, lowering gross profit, not following the traditional trajectory of improving the performance valued by mainstream consumers, introducing new trajectory of performance and improving performance along parameters different from the traditional ones. In addition, the theory describes the game between new entrants and incumbents. The weak side ought to rely on innovation to subvert their strong competitors. The theory of disruptive innovation has proved to be a powerful way of thinking about innovation-driven growth. One of the key characteristics of disruptive innovations is the entry of new players into the market who challenge traditional business models. These newcomers often offer a unique approach or product that shakes up the existing landscape and forces established companies to adapt or risk becoming obsolete. The adoption of eProcurement strategies needs a strategic and upbeat approach so as to figure out the system indoors the structures rather than espousal of wholly new systems. As we cannot deny the value of disruptive innovation, we cannot also ignore that it may not have a positive impact on society when instigated. Therefore, researchers ought to upsurge single-mindedness on the positive side of web-based technology, including disruptive technology, because it is highly correlated with people's desire for a better society.

2.1.3. Technology Acceptance Theory

The research on the espousal of technology became of prime importance in the 1980s, which concurred with the growth of the use of personal computers. It was initially acquainted by Davis in 1986 as in information system theory that models how users come to receive and use technology. The theory posits that actual technology use is directly dogged by an individual's intents to use technology. Behavioral intention is a factor that leads people to use technology. The acceptance of technology is foreseen by the user's behavioral intent, which is, in turn, dogged by the acuity of technology usefulness in performing the task and perceived ease of its use. The acceptance and the use of information technologies can bring immediate and long-term benefits at organizational or individual levels, such as improved performance, financial, time efficient, and expediency if the change is acknowledged. In contrary, new technology cannot improve organizational efficiency and effectiveness if the change is not accepted by users (Davis, 1986). The technology acceptance theory is based on two assumptions. The first one is the recognition of usefulness of the system itself: improved performance, enhanced productivity, effectiveness and efficiency in operations. The second is the perceived ease of use of the new system such as ease to learn, ease to use, ease to control and ease to remember. These three theories fit to conduct the entire study and abetted the pollster to elude aberration on the research variables and the research statement.

2.2. Empirical Literature Review

The empirical review is what a researcher gathers from factual analysis carried out by other researches. It talks about how variables are allied with each other expressly between the independent and dependent variables of a study. Finally, the researcher finds a position as to whether his/her own work is aligned to previous studied or not and at the same time pointing out the weaknesses of other similar articles. As an academic review, the pollster focused on summarized and analyzed findings of empirical research studies to better understand and refer to what other scholars have said regarding eProcurement Practices vis- a -vis Procurement Performance in governance institutions in different research areas.

2.2.1. e-Informing and Procurement Performance in Governance Institutions of Rwanda

Considering the investigation done by Nancy (2017) on e-Informing and e-Ordering on the performance of supply chain of State Corporations in County Government of Nairobi utilizing explanatory research design, multiple regression analysis results showed that electronic information has a significant impact on the performance of supply chain. The researcher assured that e-informing is the element of the dimensions of eProcurement and it improves the performance of supply chain.

Another study was conducted by Gichuhi (2021) on the impact of electronic information on the procurement performance of geothermal energy development companies in Kenya. An engaging exploration configuration was embraced in his review. Target populace incorporated the absolute number of representatives working in obtainment and strategies divisions in Geothermal Improvement Organization Nakuru area. Results showed that e-information has a positive relationship with procurement performance.

2.2.2. e-Tendering and Procurement Performance in Governance Institutions of Rwanda

Taking onto account the study conducted by (Waka, 2016) on the adoption of e-tendering and procurement performance by oil marketing companies in Kenya, finding pointed out that most

companies in Kenya still use a wide range of measures using traditional bidding methods. However, there was a significance correlation between e-procurement and procurement performance. It is shown that, a company's decision to adopt and deploy a particular IT is influenced by many different factors.

On the study conducted by the United Nations (2011) on evaluation of e-procurement in federal governments, results indicated that eProcurement saved the federal governments more than six million dollars by outsourcing manual document copying and distribution. They pointed out that e-calls, e-selections and e-awards were key factors in implementing efficaciously e-tendering in enactment of procurement activities. Most of the respondents denied its utilization in companies. Further, the study observed that e-tendering does not play a significant role in determining the efficiency of procurement performance. It was noted however, that e-tendering negatively affects procurement performance in companies. Therefore, the study concludes that e-procurement does not have significance impact on procurement efficiency.

2.2.3. e-Sourcing and Procurement Performance in Governance Institutions of Rwanda

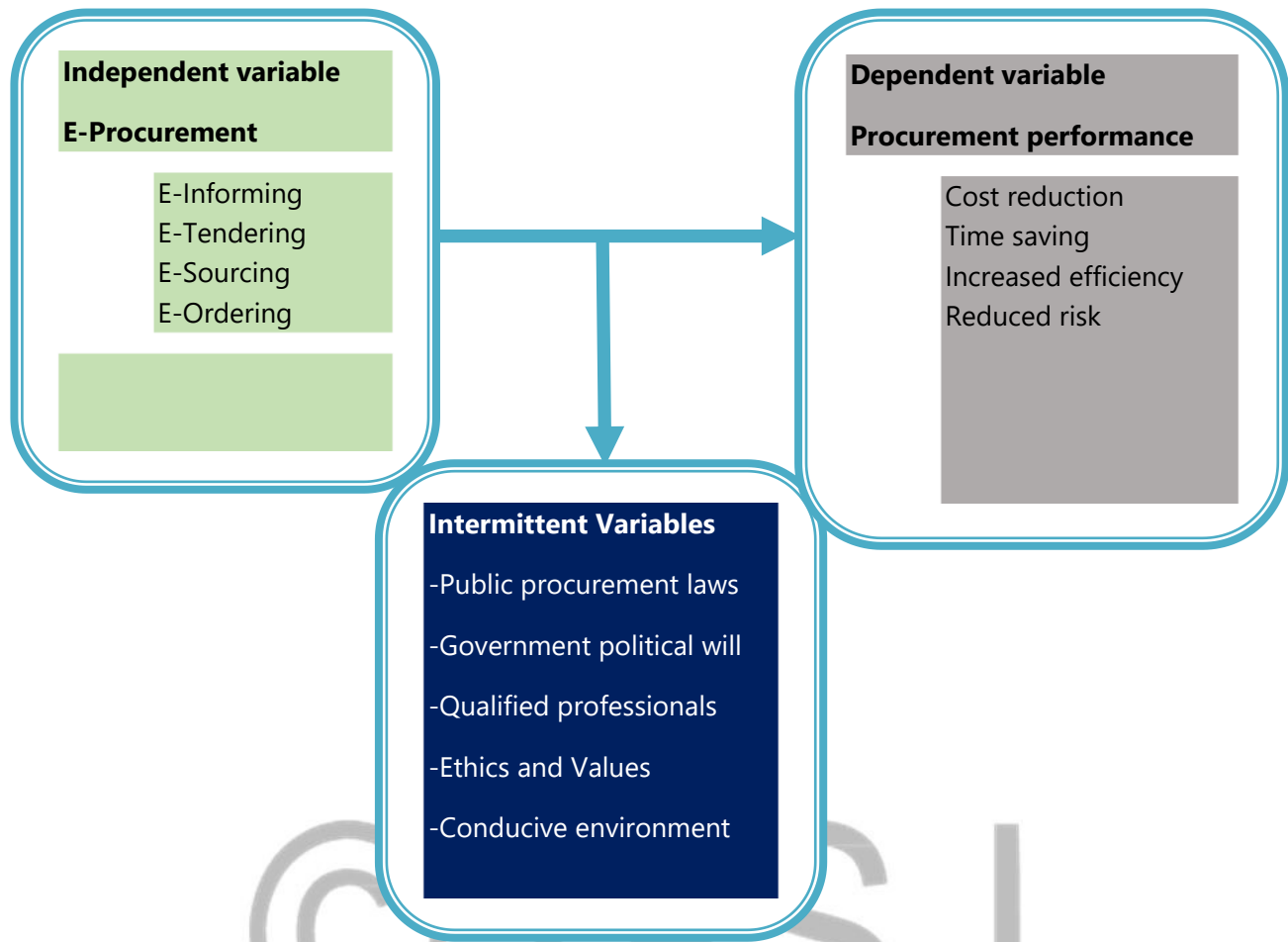
Centered on the research conducted by Daniel & Cecilia (2022) on e-procurement and organization performance to examine effect of electronic procurement practices, e-sourcing in this case, with the specific objectives to determine the impact of e-sourcing on organization efficiency, to establish the impact of e-payment on organization efficiency, and to determine the impact of e-tendering on efficient within the organization, the results indicated that there was a significant change due to the espousal of e-procurement practices in running the organization's supply chain as a tactic. The use of e-procurement practices, e-sourcing, helped the organization to search for potential suppliers to reduce search costs (Madzimure et al. 2020).

2.2.4. e-Ordering and Procurement Performance in Governance Institutions of Rwanda

Based on the study carried out by Checkurui Chepkwony (2017) on e-ordering and e-information, the results of the research showed that electronic ordering contributes greatly to the performance of the supply chain. It is clear that electronic ordering of commodities, orders to receive payment for commodities, and provided, processing of invoices from suppliers, processing of payments to suppliers, approval of purchase orders are processed. E-Ordering also increases productivity and improves customer service because commodities can be purchased electronically. As a result, dependence on manual interventions will decrease as online ordering systems take over traditional procurement process or paper-based procurement.

2.3. The Conceptual Framework of the Study

The study scrutinized how eProcurement practices relate to procurement performance in government institutions of Rwanda. The independent variables of the same study were brought from electronic procurement practices and encompass e-informing, e-tendering, e-sourcing and e-ordering. On the other hand, dependent variables were brought from institutional procurement performance and encompass cost reduction, time saving, increased efficiency and, reduced procurement risks.



3. Research Methodology and Design

A research is carried out using three research methods, namely qualitative, quantitative or a combination of both and the researcher has chosen a combination of both, that is to say, mixed methods research approach. Mixed methods research approach is a procedure of collecting, analyzing, and mixing both qualitative and quantitative research and methods in a single study to understand a research problem. That means we don't just collect and analyze both types of data. This involves using both approaches concurrently so that the overall strength of the study is greater than qualitative or quantitative research (Creswell & Plano Chark, 2007).

To better conduct this research study, the researcher chose to use both probability and non-probability sampling techniques whereby simple random sampling, stratified sampling, and purposive sampling techniques were utilized to designate the sample size of this study. Random Sampling technique was chosen due to the fact that each element has the same probability of being chosen. The researcher used stratified sampling technique to get more accurate information, a more sundry range of data and the work of collecting the data was handy. Purposive or judgmental sampling was also chosen due to the fact that it is a strategy in which particular settings persons or events are selected purposely in order to provide important information that cannot be obtained from other choices.

Data collection was carried out through questionnaire as the major data collection tool. Primary data was collected from utilizing questionnaires in the field whereas secondary data was compiled from available published records. In addition, a structured interview was conducted to get thorough

information about participant's perspectives and experiences related to the specific topic of the study. Also, the researcher used electronic resources because they are more supportive in the research process to get updates needed information. The pollster applied the Pearson's Correlation Coefficient r of the scores of respondents' responses to an item with their total scores to compute the soundness of the instrument used while collecting the data used in this study. Vis-à-vis reliability, the questionnaire was tested reliable by using the Cronbach's Alpha Coefficient to conclude the internal steadiness of the items. Accurate questionnaires were coded and entered into the SPSS version 23 software for analysis and findings were presented in descriptive statistics in clear insights within the shape of frequencies, percentages, means, and standard deviations as illustrated in tables. Furthermore, inferential statistics were also used in this study to test research hypothesis and to assess whether the data of this study are to be generalized to the broader population, that is to say, to other governance institutions of Rwanda apart from the Ministry of Finance and Economic Planning which was the case of this study.

4. Results and Discussions

4.1. Demographic of the Study

The researcher has provided the demographic picture of the respondents to deliver a brief description of their characteristics as these could have possible influence in the study. Focusing on the gender of respondents, the population was made of 38 males and 33 females, which represent 53.5% and 46.5% respectively. Apropos the age of respondents, their age ranged from twenty (20) to fifty-one (51) years of age. The majority of the respondents ranged between thirty-six (36) and forty-three (43) years of age. In terms of academic levels of the respondents, it varied. The majority fifty-four (54) had bachelor's degree, twelve (12) had master's degree, and five (5) had PhD. Concerning work experience of the respondents, the majority thirty-eight (38) had experience between six (6) to fifteen (15) years of experience. Six (6) had less than five (5) years of experience, twelve (12) had between sixteen (16) and twenty-five (25) years of experience, while fifteen (15) had over twenty-five (25) years of experience.

4.2. Discussion of results of the Study

4.2.1. E-Informing and Procurement Performance in Rwandan Governance Institutions

Concerning the first objective of the study which was to assess the effect of e-informing on procurement performance in governance institutions of Rwanda, results revealed that there is a strong correlation among e-informing and procurement performance in governance institutions of Rwanda, whereby $r = 0.966$, $p = 0.000$ while $n=71$. The results also exemplified that e-informing significantly made changes in procurement performance in governance institutions of Rwanda. This implies that an additional unit of e-Informing increases the procurement performance in governance institutions of Rwanda by 3.014. The standardized coefficient ($\beta = 0.966$, $p = 0.000$) displays a statistically significant relationship between the e-Informing and procurement performance in governance institutions of Rwanda.

4.2.2. E-Tendering and Procurement Performance in Rwandan Governance Institutions

Vis-à-vis the second objective of the study which was to find out the effect of e-tendering on procurement performance in governance institutions of Rwanda, results exposed a strong correlation among e-tendering and procurement performance in governance institutions of Rwanda whereby $r =$

0.974, $p = 0.000$ while $n=71$. The results also epitomized that e-tendering significantly made changes in procurement performance in governance institutions of Rwanda. This implies that that an additional unit of e-tendering increases the procurement performance in governance institutions of Rwanda by 2.514. The standardized coefficient ($\beta = 0.974$, $p = 0.000$) shows a statistically significant relationship between the e-tendering and procurement performance in governance institutions of Rwanda.

4.2.3. E-Sourcing and Procurement Performance in Rwandan Governance Institutions

Regarding the third objective of the study which was to determine the effect of e-sourcing on procurement performance in governance institutions of Rwanda, results embodied that there is a strong correlation among e-sourcing and procurement performance in governance institutions of Rwanda whereby $r = 0.940$, $p = 0.000$ while $n=71$. The results abridged that e-sourcing significantly made changes in procurement performance in governance institutions of Rwanda. This implies that an additional unit of e-sourcing increases the procurement performance in governance institutions of Rwanda by 2.291. The standardized coefficient ($\beta = 0.940$, $p = 0.000$) shows a statistically significant relationship between the e-sourcing and procurement performance in governance institutions of Rwanda.

4.2.4. E-Ordering and Procurement Performance in Rwandan Governance Institutions

The fourth objective of the study was to ascertain the effect of e-ordering on procurement performance in governance institutions of Rwanda. Results revealed that $r = 0.980$, $p = 0.000$ meanwhile $n=71$. Basing on the findings, there is strong relationship between e-ordering and procurement performance in governance institutions of Rwanda. The results also illustrated that e-ordering significantly made changes in procurement performance in governance institutions of Rwanda. This indicates that an additional unit of e-ordering increases the procurement performance in governance institutions of Rwanda by 3.555. The standardized coefficient ($\beta = 0.980$, $p = 0.000$) showed a statistically significant relationship between the e-ordering and procurement performance in governance institutions in of Rwanda.

5. Conclusion and Recommendations

5.1. Conclusion

Based on the results and following the research drive which was to ascertain the effects of eProcurement Practices and Procurement Performance in Governance Institutions of Rwanda, a case of the Rwandan Ministry of Finance and Economic Planning, the study concluded that there is strong correlation between eProcurement practices and procurement performance in the governance institutions of Rwanda. This is explained by the Correlation Coefficient (R) which is equal to 0.988 and this displays the strong relationship between electronic procurement practices and procurement performance in governance institution of Rwanda. Moreover, this relationship is also strengthened by the coefficient of determination which is expressed as R squared which is equal to 0.976.

5.2. Recommendations

Centered on the results of this study, recommendations are provided and addressed to the salespersons or venders to open and have eProcurement system within Umucyo eProcurement system to access online tenders for better procurement performance and good service delivery. Recommendations are also addressed to the Rwandan governance institutions to continue providing

sufficient trainings to the procurement officers, tendering committees, and procurement specialists in order to sharpen their skills in policy, laws and regulations governing procurement in Rwanda.

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