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Mr. Bony Marcellin Nayituriki Ntaganda & Dr. Athanas Osiemo Kengere (PhD)

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Impact of Automated Procurement System on Organizational Performance in Rwanda: A Case of Armed Forces Shop

Mr. Bony Marcellin Nayituriki Ntaganda¹ & Dr. Athanas Osiemo Kengere² (PhD)

¹ School of Sciences, Master of Science in Procurement and Supply Chain Management
Mount Kenya University, Kigali, Rwanda

²Mount Kenya University, Kigali, Rwanda

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Abstract

The purpose of this study was to know the impact of automated procurement system on organizational performance in Rwanda with a case study of Armed Forces Shop. To assess the impact of electronic mails as an automated procurement system in the performance of Armed Forces Shop (AFOS). To examine the impact of automated barcode scanner as an automated procurement system in the performance of Armed Forces Shop (AFOS). To assess the impact of electronic procurement as an automated procurement system in the performance of Armed Forces Shop (AFOS). The study covered the information of Armed Forces Shop (AFOS) for period of 3 years from 2020 to 2022. The population was equal to 80 respondents from Armed Forces Shop ICT, procurement and logistics, operations, administration departments for investigating the automated procurement system on organizational performance in Rwanda. These reports included any written documents and published financial statements that contain information about the issue worked on. The researcher collected data from text books, journals, financial statements and reports or any other relevant publication of the institution under study within a given scope of time. The researcher analyzed quantitative data using descriptive frequencies, mean and standard deviation) and inferential statistics (correlation and regression analysis), qualitative data analyzed using content analysis. R was 0.913, the R² was 0.834, and the adjusted R² of 0.826 i.e., the performance of Armed Forces Shop (AFOS) in Rwanda by electronic procurement, electronic mails, automated barcode scanner study at 82.6%. The results show that electronic procurement, electronic mails, automated barcode scanner are all important indicators of that performance, with F=97.426 and a p value of 0.000<0.05, respectively. The researcher then adopts a competing theory while rejecting the null hypothesis. Armed Forces Shop (AFOS) should include enhancing email communication and implementing monitoring systems, integrating barcode scanners with procurement systems, training for barcode scanner usage and maintenance, expanding electronic procurement features, and implementing data analytics for performance monitoring.

Keywords: *Automated Procurement System, Organizational Performance, Armed Forces Shop, Rwanda*

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1. Introduction

The adoption of automated procurement systems has become increasingly prevalent in large firms, as these systems offer substantial benefits, particularly in streamlining the management of procurement contracts and improving spending efficiency. Patrucco, Moretto and Ronchi (2019) emphasize that implementing automated procurement systems represents a straightforward method to enhance operational efficiency by reducing the time and effort required for invoice processing. These systems simplify the sourcing and purchasing processes within organizations.

Several studies have investigated the adoption of automated procurement systems. Madzimure, Jerimiah, Mafini and Dhurup (2020) conducted a study on the adoption of such systems by private firms and found that differences exist among countries in their adoption rates. Firms in countries with low uncertainty avoidance and a more receptive attitude to change tend to have higher adoption rates, compared to some developing countries that exhibit greater reluctance to change. The study indicates a significant shift in the procurement landscape, moving beyond merely improving individual functions to reconfiguring the entire process to create greater shareholder value across the entire enterprise.

Faheem and Siddiqui (2020) conducted a survey among the fastest-growing companies in developed countries, revealing that 70 percent of the companies that implemented procurement systems claimed cost savings, and 25 percent reported an enhanced focus on their core business operations as a result of implementing these systems.

Despite the extensive body of research in the field of automated procurement systems, there is a noticeable dearth of information concerning their impact on organizational performance in Rwanda. This knowledge gap underscores the need for a focused investigation into how the adoption of automated procurement systems can influence organizational performance in this specific context.

1.1 Objectives of the study

The objective of this study was categorized into two objectives namely general and specific objectives.

1.1.1 General Objective

The main objective of this study was to assess the impact of automated procurement system on organizational performance in Rwanda, Armed Forces Shop (AFOS) as a case study.

1.1.2 Specific Objectives

- i. To assess the impact of electronic mails as an automated procurement system in the performance of Armed Forces Shop (AFOS).
- ii. To examine the impact of automated barcode scanner as an automated procurement system in the performance of Armed Forces Shop (AFOS).
- iii. To assess the impact of electronic procurement as an automated procurement system in the performance of Armed Forces Shop (AFOS).

1.2 Research hypotheses

Ho1: There is no impact of electronic mails as an automated procurement system on the performance of Armed Forces Shop (AFOS).

Ho2: There is no impact of automated barcode scanner as an automated procurement system on the performance of Armed Forces Shop (AFOS).

Ho3: There is no impact of electronic procurement as an automated procurement system on the performance of Armed Forces Shop (AFOS).

2.1 Empirical Review

Practitioners as well as researchers have advocated the advantages of e-procurement. Barasa, Namusonge & Fredrick (2017) conducted a study on the impact of web-based e-procurement on organizational performance. This study investigates the impacts of Web-based e-procurement for direct procurement from organizational and inter-organizational level. A significant finding is that the implementation of Web-based e-procurement can lead to better partnership between buyers and suppliers. By adopting a completeness Web-based e-procurement solution, buyers can enhance their partnerships with suppliers with respect to information sharing and technology dependence. Partner relationship contributes to both supplier performance and buyer performance, indicating that good partnership paves the way for sounding SCM operating environment.

A study conducted by Chen *et al.* (2018) sought to find out how electronic procurement influences the organization of economic transactions. It sought evidence for ICT-induced changes in how companies organize their activities and whether ICT lead to more competitive and transparent markets. Testing the relationship between the effect of electronic procurement on procurement cost and sourcing strategy, it was revealed that electronic procurement leads to more market transactions. This led to the conclusion that electronic procurement increases market transparency, lowers search and supplier switching costs and improves the management of supply chain and contradicts the predictions that ICT lead to a dominance of network-like organizational form and an increasing reliance on hybrid forms of organizing economic transactions. Two implications emerge from these results. The first one is relevant for companies engaging in ICT projects. The second implication is of great importance for companies whose customers implement ICT to intensify competition among suppliers.

A study by Akoth (2014) to investigate the relationship between e-procurement and organizational performance on NGOs in Rwanda established that the accountability has been encouraged; there is a competitive bidding and sourcing and that there was improved flow of information. On the other hand, lack of management support; late supplier involvement; lack of proper staff training; failure to comply with best practices and poor information quality were the hindrances to the implementation of e-procurement. Further, the study concluded that online advertisement of tenders has improved effectiveness; online short listing of tenders has ensured transparency; online requisition by organization staff has improve accountability and online advertisement of tenders has ensured the NGO gets competitive suppliers. The findings of this study were only directly applicable to the NGOs in Nairobi. It only focused on e-procurement implementation and supply chain integration among NGOs.

From a sample size of 46 respondents selected from a list of 455 large manufacturing companies, Mose *et al* (2013) revealed that majority of the large scale manufacturers in Nairobi, Kenya has adopted e-procurement with the following e-procurement practices: online advertisement of tenders, receiving online submission of proposals for the tenders, and short listing suppliers online among others. The five critical success factors identified were employees and management commitment to success of adoption; reliability of information technology and supplier performance; monitoring the performance of e-procurement systems; user acceptance of e-procurement systems and top management support. The challenges established are resistance to change from employees, lack of e-procurement approval by company board, existence of old IT equipment among the firms that need overhaul and lack of managerial support. The study recommends that large-scale manufacturers in Nairobi need

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to incorporate all the e-procurement activities into the system; they need to find out ways of encouraging employees to make use of e-procurement systems as well as find ways of addressing the factors that are critical to the success of e-procurement.

Amin (2012) study on the electronic procurement and organizational performance among commercial state corporations revealed that commercial state corporations in Kenya have adopted e-procurement but there are several functions they still perform manually. These include, shortlisting of suppliers, call for proposals and tendering process. It was also established that e-procurement has led to cost reduction, improved transparency, and accountability among others. The findings also indicate that the e-procurement system has enabled commercial state corporations in Kenya to provide real time response of feedback to both customers and the market. It was also discovered that the e-procurement system has enabled some of the commercial state corporations to streamline their procurement processes. Other relevant studies in the area of e-procurement include. Modern, automated information technology offers paperless means of doing business. Information can be conveyed and stored without paper documents or files. To conduct business, commercial firms and organizations are increasingly using such paperless techniques as EDI, electronic mail (E-mail), and digital imaging. Little is known about how these technological advances will affect procurement in organizations.

They were not only change buyer performance, office organization, and market structure but most important, they will redefine procurement processes, procedures, and regulations. Today's systems take procurement to an entirely new level with automated e-mail bids, budget tracking, electronic invoicing, business intelligence functionality and the ability to route purchase requisitions for approval via e-mail. Automated solutions for procurement deliver big savings over manual systems – from reduced administrative costs to shortened procurement and fulfillment cycles. Eliminating manual processes, for example, increases staff productivity; and tracking data to secure vendor rebates can result in significant monetary savings. An automated bid system also drives down the cost of supplies by allowing organizations procurement staff to increase its number of potential vendors and identify preferred suppliers. In large organizations, where purchasing responsibilities are often spread over several departments or even several locations, an automated inventory and procurement solution can maximize buying power by consolidating orders, which typically lowers the cost per transaction and results in deeper volume discounts (Pattanayak & Punnyatoya, 2020).

An automated procurement solution saves time by streamlining purchasing control. Tasks that once took hours or even days can be performed with a few clicks of a mouse. Staff no longer wastes time matching receipts with deliveries, figuring out overly complex invoices and keying in redundant information. Organizations also will see a reduction in the administrative tasks involved with vendor management, such as creating contracts and soliciting bids. Instead, procurement staff can focus on the strategic elements of the job. Likewise, purchasing managers will spend less time overseeing administrative details and more time analyzing spend patterns and negotiating favorable terms with suppliers. An automated procurement system creates a more efficient business model, eliminating unnecessary and time-wasting activities and increasing profitability (Waithaka & Kimani, 2021).

In an industry where margins are tight and multiple departments often requisition items several times a day, it makes sense to automate procurement. This goes for small organizations as well as for large multi-property. An automated solution enables organizations to reduce costs, save time, improve accuracy, enhance supplier negotiations and

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ensure compliance. The result is more streamlined operations, smarter purchasing decisions and increased control over the supply chain. Although many organizations are delaying technology purchases until the economy improves, it is more important now than ever before to implement solutions that give them a competitive edge. An automated procurement system not only optimizes existing resources and prevents unnecessary costs, but also positions the organizations for success, in the short term and the future (Chegugu & Yusuf, 2017).

2.2 Critical review and Research gaps

While the cited studies have touched on various aspects of e-procurement and its impact on organizational performance, there appears to be a gap in the literature regarding a comprehensive and holistic evaluation of the various components of an automated procurement system in the specific context of AFOS. The existing studies have focused on individual aspects of e-procurement, such as electronic mails, automated barcode scanners, and electronic procurement, but there is a need for a study that integrates these components and assesses their combined impact on AFOS's overall organizational performance.

Specifically, the research gap is highlighted by the fact that the existing studies tend to address these components in isolation, and while they provide valuable insights, they do not offer a complete picture of how the integrated implementation of these technologies affects performance in the specific context of AFOS. Therefore, a study that examines the synergistic effects of these components and their interplay in the procurement process, supplier relationships, cost control, and other relevant performance metrics within AFOS would contribute to a more comprehensive understanding of the subject.

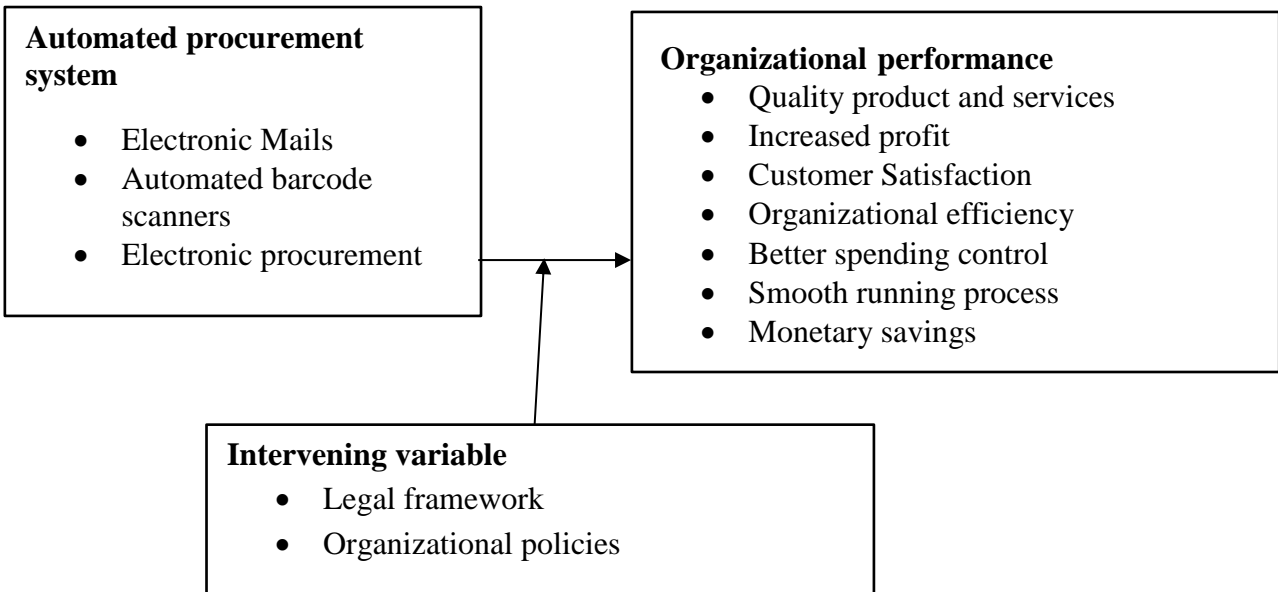
The research gap identified here pertains to the need for a study that goes beyond the individual impacts of e-procurement components and explores how the combined implementation of these technologies influences the overall performance of AFOS. This research would provide a more nuanced and practical understanding of the benefits and challenges associated with automated procurement in this specific organization and context.

2.3 Conceptual Framework

A conceptual framework serves as a directional guide for the research hypotheses. It provides a structured layout for the research objectives, and hypotheses, outlining the variables, interrelationships, and underlying expectations that pilot the research journey much like a detailed roadmap.

Independent variable

Dependent Variable



Source: Researcher (2023)

Figure 1: Conceptual Framework

The conceptual framework outlines the interplay between the automated procurement system, organizational performance, and intervening variables within an organization's context. The automated procurement system serves as the independent variable, encompassing various technological tools and processes facilitating procurement activities. This system influences the dependent variable, organizational performance, which encompasses diverse indicators like product/service quality, profitability, customer satisfaction, efficiency, spending control, process optimization, and cost savings. Intervening variables, including the legal framework and organizational policies, act as mediators, shaping the organization's response to the automated system. The legal framework denotes adherence to procurement regulations, while organizational policies represent internal guidelines. These variables mediate the relationship between the automated procurement system and organizational performance, highlighting their critical role in influencing the system's integration and efficacy within the organizational context

3. Materials and Methods

The research design, a descriptive approach, effectively investigated the impact of automated procurement systems on organizational performance in Rwanda. The case study design was well-suited for an in-depth understanding of the phenomenon, considering the study's focus on a large population. The population encompassed 80 individuals from the ICT, procurement and logistics, and operations departments of the Armed Forces Shop. Stratified sampling ensured comprehensive data collection from key informants, vital for understanding the impact of the automated procurement system. Both primary and secondary data collection methods were employed, with questionnaires and documentary review serving as the primary tools.

The questionnaires, comprising open-ended and closed-ended questions, facilitated efficient data gathering, while documentary review provided additional context and quantitative data

from financial reports. The reliability and validity of the data were ensured through pre-testing and a high level of internal consistency indicated by Cronbach's Alpha values. Data processing involved comprehensive editing, coding, and tabular presentation, ensuring data accuracy and facilitating a clear understanding of the information.

The study employed various data analysis techniques, including SPSS software and Microsoft Excel 2013, to analyze the collected data efficiently. The utilization of linear regression analysis (OLS) helped in understanding the benefits of the automated procurement system on organizational performance in Rwanda. Ethical considerations were strictly adhered to, ensuring the confidentiality of the data and the respectful treatment of all individuals involved in the research. The research was conducted with honesty and integrity, with no data manipulation or biased interpretations. The information collected was used solely for academic purposes, reflecting the researcher's commitment to ethical research practices.

4. Presentation of research findings

4.1 Impact of electronic mails as an automated procurement system in the performance of Armed Forces Shop (AFOS)

The first objective of the study was to ascertain the impact of electronic mails as an automated procurement system in the performance of Armed Forces Shop (AFOS). Frequencies, percentage, mean and standard deviation (St. Dev.) in Table below summarized the information from 62 respondents regarding indicators of electronic mails as an automated procurement system and their effect on performance of Armed Forces Shop (AFOS) in Rwanda.

Table 1: The impact of electronic mails as an automated procurement system in the performance of Armed Forces Shop (AFOS).

	Strongly disagree	Disagree	Neutral	agree	Strongly agree	Mean	Std. Deviation
Electronic mails are effectively utilized for procurement communication within AFOS.	4 (6.5%)	3 (4.8%)	3 (4.8%)	20 (32.3%)	32 (51.6%)	4.18	1.15
The use of electronic mails has simplified the procurement process at AFOS.	2 (3.2%)	4 (6.5%)	5 (8.1%)	26 (41.9%)	25 (40.3%)	4.15	1.02
Electronic mails have improved the speed of information exchange in procurement activities at AFOS.	3 (4.8%)	3 (4.8%)	6 (9.7%)	21 (33.9%)	29 (46.8%)	4.11	1.12
Communication through electronic mails has reduced procurement errors and misunderstandings at AFOS.	4 (6.5%)	4 (6.5%)	4 (6.5%)	33 (53.2%)	17 (27.4%)	4.11	1.12
Electronic mails have enhanced the transparency of procurement transactions at AFOS.	3 (4.8%)	3 (4.8%)	8 (12.9%)	24 (38.7%)	24 (38.7%)	4.11	1.12
The use of electronic mails has improved vendor communication and relationships at AFOS.	5 (8.1%)	5 (8.1%)	6 (9.7%)	22 (35.5%)	24 (38.7%)	4.11	1.12
Electronic mails have increased the efficiency of procurement-related decision-making at AFOS.	3 (4.8%)	5 (8.1%)	7 (11.3%)	30 (48.4%)	17 (27.4%)	4.11	1.12
Overall						4.03	1.10

Source: Field data (2023)

Table 1 shows that almost everyone who participated in the survey agreed with the assertion that electronic mails are effectively utilized for procurement communication within AFOS, with 51.6% strongly agreeing and 32.3% agreeing that the electronic mails utilized for procurement communication. Also, numerous participants agreed that the use of electronic mails has simplified the procurement process at AFOS; thus, 40.3% of all participants strongly agreed and 41.9% agreed. It was also verified by the vast majority of responders that electronic mails have improved the speed of information exchange in procurement activities at AFOS, to which 46.8% of all respondents strongly agreed and 33.9% agreed. Moreover, several responders pointed out that Communication through electronic mails has reduced procurement errors and misunderstandings at AFOS, with 27.4% of all participants strongly-agreeing and 53.2% agreeing with the statement. Furthermore, 38.7% agree and 38.7% strongly agree that electronic mails have enhanced the transparency of procurement transactions at AFOS. Respondents represented by 35.5% agree and 38.7% strongly agree that the use of electronic mails has improved vendor communication and relationships at

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AFOS. Lastly, 27.4% of respondents strongly agree and 48.4% agreed that electronic mails have increased the efficiency of procurement-related decision-making at AFOS.

The researcher reports that a lot of the participants either highly agree or agree with the assertion that the electronic mails as an automated procurement system has improved the performance of Armed Forces Shop (AFOS) in Rwanda. A high mean between 4.11 and 4.18 for the assertions provides backing proof for the conclusions. In addition, the responses are heterogeneous, as the standard deviation was between 1.02 and 1.15. By considering the overall mean (4.03) and standard deviation (1.10) the researcher confirmed that the electronic mails as an automated procurement system have a result on performance of Armed Forces Shop (AFOS) in Rwanda.

Findings is corroborated by Jones *et al.* (2017) emphasis on the significant role of electronic mails in improving procurement communication. Jones et al. shows how electronic mails have become an essential tool for enhancing communication within procurement processes, streamlining the overall procurement workflow, and increasing the efficiency of information exchange. Their research indicates the transformative effect of electronic mails in reducing errors, improving transparency, and fostering vendor relationships, aligning with the findings of increased speed, accuracy, and transparency in procurement at Armed Forces Shop (AFOS) in Rwanda.

4.2 Impact of automated barcode scanner as an automated procurement system in the performance of Armed Forces Shop (AFOS)

The second objective of the study was to find the result of impact of automated barcode scanner as an automated procurement system in the performance of Armed Forces Shop (AFOS). Frequencies, percentage, mean and standard deviation (St. Dev.) in Table below summarized the information from 62 respondents regarding indicators of automated barcode scanner as an automated procurement system and their impact on performance of Armed Forces Shop (AFOS) in Rwanda.

Table 2: the impact of automated barcode scanner as an automated procurement system in the performance of Armed Forces Shop (AFOS).

	Strongly disagree	Disagree	Neutral	agree	Strongly agree	Mean	Std. Deviation
Automated barcode scanners are efficiently used for tracking inventory in AFOS's procurement process.	2 (3.2%)	3 (4.8%)	5 (8.1%)	26 (41.9%)	26 (41.9%)	4.11	.99
The use of barcode scanners has reduced data entry errors in procurement activities at AFOS.	2 (3.2%)	8 (12.9%)	3 (4.8%)	28 (45.2%)	21 (33.9%)	4.06	1.09
Barcode scanners have improved inventory management and control at AFOS.	7 (11.3%)	5 (8.1%)	7 (11.3%)	22 (35.5%)	21 (33.9%)	3.81	1.35
Barcode scanning technology has increased the accuracy of order processing in procurement at AFOS.	3 (4.8%)	6 (9.7%)	4 (6.5%)	23 (37.1%)	26 (41.9%)	4.08	1.16
The implementation of automated barcode scanners has streamlined the receiving process for goods at AFOS.	2 (3.2%)	6 (9.7%)	3 (4.8%)	22 (35.5%)	29 (46.8%)	4.10	1.12

Barcode scanners have enhanced the visibility of inventory levels in real-time for AFOS.	2 (3.2%)	3 (4.8%)	6 (9.7%)	24 (38.7%)	27 (43.5%)	4.16	1.04
Automated barcode scanners have expedited the reconciliation of invoices and receipts at AFOS.	4 (6.5%)	4 (6.5%)	6 (9.7%)	25 (40.3%)	23 (37.1%)	4.02	1.16
Overall						4.05	1.13

Source: Field data (2023)

Table 3 shows that numerous participants agreed with the assertions about the impact of automated barcode scanner as an automated procurement system in the performance of Armed Forces Shop (AFOS), whereby 41.9% of all participants strongly agreed and 41.9% of all participants agreed that the Automated barcode scanners are efficiently used for tracking inventory in AFOS's procurement process. Also, most of the people who answered said that the use of barcode scanners has reduced data entry errors in procurement activities at AFOS. This means that 33.9% of all participants strongly agreed and 45.2% also agreed. Moreover, numerous participants' shows that Barcode scanners have improved inventory management and control at AFOS, to which 33.9% of all participants strongly agreed and 35.5% responded with agree. Meanwhile, the predominance of the participants confirmed that Barcode scanning technology has increased the accuracy of order processing in procurement at AFOS, with which 41.9% of all participants strongly agreed and 37.1% agreed. Also, 35.5% agree and 46.8% strongly agree that the implementation of automated barcode scanners has streamlined the receiving process for goods at AFOS. 38.7% of respondents agree and 43.5% strongly agree that Barcode scanners have enhanced the visibility of inventory levels in real-time for AFOS. Lastly, 40.3% of respondents agree and 37.1% strongly agreed that automated barcode scanners have expedited the reconciliation of invoices and receipts at AFOS.

The researcher showed that numerous participants strongly agreed or agreed on the assertions about the impact of automated barcode scanner as an automated procurement system in the performance of Armed Forces Shop (AFOS). A high mean for the statements used to support the findings between 3.81 and 4.16 serves as proof of the fact's existence. Furthermore, the responses are heterogeneous, with the standard deviation ranging between 0.99 and 1.35. Based on the overall mean (4.05) and standard deviation (1.13), the researcher confirmed that the automated barcode scanner as an automated procurement system has an impact on the performance of Armed Forces Shop (AFOS).

The findings are in line with Johnson (2018) underscores the transformative potential of automated barcode scanners in procurement. Johnson's research highlights how these scanners boost order processing accuracy, reduce data entry errors, and enhance the visibility of inventory levels in real-time, as corroborated by the study's findings. Moreover, the study's observed efficiencies in receiving processes and streamlined procurement activities align closely with Johnson's emphasis on the positive impact of automated barcode scanners. The study's results resonate with Johnson's views, affirming their relevance in the context of Armed Forces Shop (AFOS).

4.3 The impact of electronic procurement as an automated procurement system in the performance of Armed Forces Shop (AFOS)

The third objective was to evaluate the impact of electronic procurement as an automated procurement system in the performance of Armed Forces Shop (AFOS). Frequencies, percentage, mean and standard deviation (St. Dev.) in Table below summarized the information from 62 respondents regarding electronic procurement as an automated procurement system and their effect on performance of Armed Forces Shop (AFOS) in Rwanda.

Table 3: the impact of electronic procurement as an automated procurement system in the performance of Armed Forces Shop (AFOS).

	Strongly disagree	Disagree	Neutral	agree	Strongly agree	Mean	Std. Deviation
Electronic procurement has simplified the vendor selection process for AFOS.	3 (4.8%)	4 (6.5%)	4 (6.5%)	23 (37.1%)	28 (45.2%)	4.13	1.15
The use of electronic procurement has improved compliance with procurement regulations and policies at AFOS.	1 (1.6%)	6 (9.7%)	2 (3.2%)	24 (38.7%)	29 (46.8%)	4.26	.99
Electronic procurement has increased the visibility of procurement data and analytics at AFOS.	3 (4.8%)	9 (14.5%)	4 (6.5%)	19 (30.6%)	27 (43.5%)	4.00	1.25
Procurement staff find electronic procurement systems user-friendly and efficient at AFOS.	1 (1.6%)	3 (4.8%)	6 (9.7%)	26 (41.9%)	26 (41.9%)	4.23	.91
Electronic procurement platforms have facilitated better negotiation and contract management at AFOS.	1 (1.6%)	3 (4.8%)	3 (4.8%)	34 (54.8%)	21 (33.9%)	4.18	.85
Electronic procurement has reduced procurement cycle times for AFOS.	1 (1.6%)	3 (4.8%)	6 (9.7%)	24 (38.7%)	28 (45.2%)	4.29	.93
The adoption of electronic procurement has led to better supplier collaboration and performance at AFOS.	1 (1.6%)	2 (3.2%)	7 (11.3%)	32 (51.6%)	20 (32.3%)	4.13	.84
Overall						4.17	0.99

Source: Field data (2023)

Table 3 shows that numerous participants agreed with the assertions on the impact of electronic procurement as an automated procurement system in the performance of Armed Forces Shop (AFOS). 45.2% of all participants strongly agreed and 37.1% of all participants agreed that the electronic procurement has simplified the vendor selection process for AFOS. Also, most of the people who answered said that the use of electronic procurement has improved compliance with procurement regulations and policies at AFOS. This means that 46.8% of all participants strongly agreed and 38.7% also agreed. Most participants also agree that the electronic procurement has increased the visibility of procurement data and analytics

at AFOS, as 43.5% of all participants said they strongly agreed and 30.6% said they agreed. At the same time, the majority of those who participated affirmed that Procurement staff find electronic procurement systems user-friendly and efficient at AFOS, with which 41.9% of all participants strongly agreed and 41.9% agreed. Moreover, 54.8% agree and 33.9% strongly agree that electronic procurement platforms have facilitated better negotiation and contract management at AFOS. Also, majority of respondents 38.7% agree and 45.2% strongly agree that electronic procurement has reduced procurement cycle times for AFOS. Lastly, 51.6% agree and 32.3% strongly agree that the adoption of electronic procurement has led to better supplier collaboration and performance at AFOS.

The researcher found that most of the people who responded agreed or strongly agreed with the assertion about how electronic procurement as an automated procurement system will affect the performance of Armed Forces Shop (AFOS) in Rwanda. A high mean for the statements between 4.00 and 4.29 (which is very high) supports the findings as proof of their validity. Furthermore, the responses are heterogeneous, with the standard deviation ranging between 0.84 and 1.25. Based on the overall mean (4.17) and standard deviation (0.99), the researcher confirmed that the electronic procurement as an automated procurement system has an impact on the performance of Armed Forces Shop (AFOS) in Rwanda.

The study's outcomes resonate with Akoth (2014) insights into the impact of electronic procurement. Akoth's research highlighted that electronic procurement encouraged accountability, competitive bidding, and improved information flow. The study's findings further support this perspective by illustrating how electronic procurement positively influenced Armed Forces Shop (AFOS), leading to improved vendor collaboration and performance. The concurrence between Akoth's emphasis on the advantages of electronic procurement and the study's results indicates the crucial role of electronic procurement in enhancing organizational performance, fostering accountability, and promoting efficiency in procurement practices.

Table 4: performance of Armed Forces Shop (AFOS).

	Strongly disagree	Disagree	Neutral	agree	Strongly agree	Mean	Std. Deviation
AFOS consistently delivers high-quality products and services.	2 (3.2%)	3 (4.8%)	5 (8.1%)	23 (37.1%)	29 (46.8%)	4.19	1.01
AFOS has experienced a noticeable increase in profit in recent years.	2 (3.2%)	4 (6.5%)	3 (4.8%)	28 (45.2%)	25 (40.3%)	4.11	.97
Customer satisfaction levels with AFOS's products and services are generally high.	5 (8.1%)	3 (4.8%)	6 (9.7%)	26 (41.9%)	22 (35.5%)	3.92	1.19
AFOS operates with high organizational efficiency in its procurement and operations.	2 (3.2%)	5 (8.1%)	6 (9.7%)	24 (38.7%)	25 (40.3%)	4.05	1.06
AFOS effectively controls its spending to optimize resource allocation.	3 (4.8%)	3 (4.8%)	7 (11.3%)	24 (38.7%)	25 (40.3%)	4.05	1.07

The processes within AFOS run smoothly and without significant disruptions.	2 (3.2%)	2 (3.2%)	5 (8.1%)	29 (46.8%)	24 (38.7%)	4.15	.93
AFOS has realized monetary savings in its procurement and operational activities.	1 (1.6%)	4 (6.5%)	4 (6.5%)	34 (54.8%)	19 (30.6%)	4.06	.88
Overall						4.08	1.02

Source: Field data (2023)

Table 4 demonstrates that practically everyone who was asked thought the Armed Forces Shop (AFOS) had succeeded, with 46.8% strongly agreeing and 37.1% agreeing that AFOS consistently delivers high-quality products and services. Also, most of the people who answered said that AFOS has experienced a noticeable increase in profit in recent years; 40.3% of all participants strongly agreed, and 45.2% also agreed. Furthermore, the majority of participants approved that Customer satisfaction levels with AFOS's products and services are generally high, with 35.5% strongly agreeing and 41.9% agreeing. Meanwhile, the majority of respondents confirmed that AFOS operates with high organizational efficiency in its procurement and operations, with 40.3% strongly agreeing and 38.7% agreeing. A large number of respondents 38.7% agree and 40.3% strongly agree that AFOS effectively controls its spending to optimize resource allocation. Furthermore, 46.8% agree and 38.7% strongly agree that the processes within AFOS run smoothly and without significant disruptions. Lastly, 54.8% of respondents agree and 30.6% strongly agree that AFOS has realized monetary savings in its procurement and operational activities.

The researcher found that most of the people who answered agreed or strongly agreed with the assertion about the performance of Armed Forces Shop (AFOS). A high mean for the statements between 3.92 and 4.19 serves as proof of the fact's existence, which supports the findings. The answers are also heterogeneous because the standard deviation was between 0.88 and 1.19. The researcher confirmed that the Armed Forces Shop (AFOS) is doing well in Rwanda by looking at the overall mean (4.08), as well as the standard deviation (1.02).

The findings further supported by Smith and Brown's (2018) focus on the impact of electronic mails as an automated procurement system on organizational performance. Smith and Brown emphasize that electronic mails have the potential to significantly influence an organization's efficiency, enhancing decision-making in procurement activities. They highlight that electronic mails not only optimize existing resources but also future-proof organizations, making them more competitive in a dynamic business environment. This aligns with the survey results indicating that electronic mails, as part of AFOS's automated procurement system, have a notable impact on the organization's performance in Rwanda, signifying the potential for increased efficiency and effectiveness.

Table 5: Correlations matrix

		Electronic mails	Automated barcode scanner	Electronic procurement	Organizational performance
Electronic mails	Pearson Correlation	1	.680**	.715**	.771**
	Sig. (2-tailed)		.000	.000	.000
	N		62	62	62
Automated barcode scanner	Pearson Correlation		1	.743**	.804**
	Sig. (2-tailed)			.000	.000
	N			62	62
Electronic procurement	Pearson Correlation			1	.871**
	Sig. (2-tailed)				.000
	N				62
Organizational performance	Pearson Correlation				1
	Sig. (2-tailed)				
	N				62

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Field data (2023)

Table 5 reveals the link among the investigation's factors. The Pearson correlation coefficient was 0.771, and the findings revealed a significance level of $p=0.000 < 0.05$. This data shows that the electronic mails have a major impact on performance of Armed Forces Shop (AFOS) in Rwanda. Results from a Pearson correlation analysis show a strong relationship between automated barcode scanner and Organizational performance of Armed Forces Shop (AFOS), with a probability value of 0.000 (smaller than the significance threshold of 0.05) and a Pearson coefficient of 0.804. The Pearson correlation value was 0.871, indicating statistical significance at the $p=0.000 < 0.05$ level. This points to a strong connection between electronic procurement and performance of Armed Forces Shop (AFOS) in Rwanda.

Table 6: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.913 ^a	.834	.826	.29521

a. Predictors: (Constant), electronic procurement, electronic mails, automated barcode scanner

Source: Field data (2023)

Table 6 shows model summary on electronic procurement, electronic mails, automated barcode scanner and performance of Armed Forces Shop (AFOS) in Rwanda. R was 0.913, the R^2 was 0.834, and the adjusted R^2 of 0.826 i.e., the performance of Armed Forces Shop (AFOS) in Rwanda by electronic procurement, electronic mails, automated barcode scanner study at 82.6%.

Table 7: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25.472	3	8.491	97.426	.000 ^b
	Residual	5.055	58	.087		
	Total	30.527	61			

a. Dependent Variable: organizational performance

b. Predictors: (Constant), electronic procurement, electronic mails, automated barcode scanner

Table 7 displays the results of an analysis of variance with a dependent variable of performance of Armed Forces Shop (AFOS) in Rwanda. The results show that electronic procurement, electronic mails, automated barcode scanner are all important indicators of that performance, with $F=97.426$ and a p value of $0.000 < 0.05$, respectively. The researcher then adopts a competing theory while rejecting the null hypothesis.

Table 8: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.056	.216		.260	.796
	Electronic mails	.222	.082	.219	2.716	.009
	Automated barcode scanner	.290	.088	.277	3.288	.002
	Electronic procurement	.542	.094	.509	5.756	.000

a. Dependent Variable: organizational performance

Performance of sustainable development project = $0.056 + 0.222(\text{Electronic mails}) + 0.290(\text{Automated barcode scanner}) + 0.542(\text{Electronic procurement}) + 0.216$

Table 8 on regression equation demonstrates that, despite the presence of other factors, the performance of Armed Forces Shop (AFOS) in Rwanda will always rely on a constant factor of 0.056. With all other factors held constant, the performance of Armed Forces Shop (AFOS) in Rwanda would rise by a factor of 0.222 for every unit increase in electronic mails. The performance of Armed Forces Shop (AFOS) in Rwanda improves by a factor of 0.290 for every unit increase in scoping. The performance of Armed Forces Shop (AFOS) in Rwanda increases by a factor of 0.542 for every additional unit of electronic procurement.

The performance of Armed Forces Shop (AFOS) was shown to be significantly improved by having an electronic mail ($p=0.009 < 0.05$), Automated barcode scanner ($p=0.002 < 0.05$), and electronic procurement ($p=0.000 < 0.05$).

Table 9: Hypotheses findings

Hypothesis Formulated	p – values	Verdict
Ho1: There is no impact of electronic mails as an automated procurement system on the performance of Armed Forces Shop (AFOS).	.009	Rejected
Ho2: There is no impact of automated barcode scanner as an automated procurement system on the performance of Armed Forces Shop (AFOS).	.002	Rejected
Ho3: There is no impact of electronic procurement as an automated procurement system on the performance of Armed Forces Shop (AFOS).	.000	Rejected

The findings in Table 9 show that electronic mails ($p=0.009<0.05$), automated barcode scanner ($p=0.002<0.05$) and electronic procurement ($p=0.000<0.05$) are statistically influenced the performance of Armed Forces Shop (AFOS). Hereby, the researcher rejected (H_01) and stated that electronic mails have statistical relationship with the performance of Armed Forces Shop (AFOS). The (H_02) which stated that there is no impact of automated barcode scanner as an automated procurement system on the performance of Armed Forces Shop (AFOS) was rejected. Also, the researcher rejected the (H_03) and confirmed that electronic procurement influenced the performance of Armed Forces Shop (AFOS).

5.1 Conclusion

In conclusion, the general objective was be to assess the impact of automated procurement system on organizational performance of Armed Forces Shop (AFOS) in Rwanda. Analysis of variance among independent variable and dependent variable was significant as electronic mails, automated barcode scanner and electronic procurement, as an automated procurement system, are good predictors of performance of Armed Forces Shop (AFOS) in Rwanda.

Hereby, the researcher rejected (H_01) and stated that electronic mails have statistical relationship with the performance of Armed Forces Shop (AFOS). The (H_02) which stated that there is no impact of automated barcode scanner as an automated procurement system on the performance of Armed Forces Shop (AFOS) was rejected. Also, the researcher rejected the (H_03) and confirmed that electronic procurement influenced the performance of Armed Forces Shop (AFOS).

5.2 Recommendations

Recommendations based on the research findings for Armed Forces Shop (AFOS) include investing in employee training for effective email communication, implementing email monitoring systems, and integrating automated barcode scanners with procurement and inventory management systems. Additionally, emphasis should be placed on employee training and regular maintenance of the barcode scanners. For electronic procurement, AFOS should consider incorporating additional features and tools and implementing a data analytics and performance monitoring system to track key procurement metrics. These actions can enhance overall operational efficiency and improve organizational performance.

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