Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

East African Journal of Business and Economics
eajbe.eanso.org
Volume 6, Issue 2, 2023
Print ISSN: 2707-4250 | Online ISSN: 2707-4269
Title DOI: https://doi.org/10.37284/2707-4269

EANSO
EAST AFRICAN NATURE & SCIENCE ORGANIZATION

Original Article

Factors Influencing Effective Implementation of Public Sector E-procurement in Tanzania: A Case of TANROADS Iringa Regional Office

Subira Anyisile[1], Dr. Theobald Kipilimba, PhD[1] & Dr. Haji Ng'elenge, PhD[1]*

[1] University of Iringa, P. O. Box 200 Iringa, Tanzania.
* Correspondence Email: anyisile.subira@gmail.com

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

Date Published: *29 October 2023*

Keywords: *E-procurement, Effective Implementation, E-Infrastructure, Staff Competence, Management Support*

ABSTRACT

E-procurement, as a digital transformation initiative, holds significant promise for enhancing efficiency, transparency, and accountability within the public sector. This study assessed the factors that influence the effective implementation of e-procurement in the context of the Tanzania National Roads Agency (TANROADS) Iringa regional office. The research focused on three pivotal factors: e-infrastructure, staff competence, and management support. A quantitative research approach with a descriptive research design was employed, targeting a population of 95 individuals, whereby a sample of 80 respondents was drawn in the study. The data was analysed using descriptive statistics including mean and standard deviation. The findings of this study reveal crucial insights into the determinants of effective e-procurement implementation within the public sector. Firstly, e-infrastructure is found to have a significantly positive influence on effective e-procurement implementation. Secondly, staff competence is identified as a critical driver, with employees displaying a commitment to e-procurement and possessing the necessary education, albeit with room for improvement in IT skills. Lastly, management support is a significant enabler of e-procurement success, with investments in technology infrastructure, user manuals, and budgetary allocations for training, maintenance services, and technical support being essential components. This study concludes that e-infrastructure, staff competence, and management support are pivotal factors in the successful implementation of e-procurement within the public sector. The study recommends continuous training, commitment nurturing, policy review, experience sharing, technological enhancements, financial support, and the recruitment of qualified ICT personnel in driving effective e-procurement implementation.

APA CITATION

Anyisile, S., Kipilimba, T. & Ng'elenge, H. (2023). Factors Influencing Effective Implementation of Public Sector E-procurement in Tanzania: A Case of TANROADS Iringa Regional Office. *East African Journal of Business and Economics*, *6*(2), 19-36. https://doi.org/10.37284/eajbe.6.2.1540

CHICAGO CITATION

Anyisile, Subira, Theobald Kipilimba and Haji Ng'elenge. 2023. "Factors Influencing Effective Implementation of Public Sector E-procurement in Tanzania: A Case of TANROADS Iringa Regional Office". *East African Journal of Business and Economics* 6 (2), 19-36. https://doi.org/10.37284/eajbe.6.2.1540.

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

HARVARD CITATION

Anyisile, S., Kipilimba, T. & Ng'elenge, H. (2023) "Factors Influencing Effective Implementation of Public Sector E-procurement in Tanzania: A Case of TANROADS Iringa Regional Office", *East African Journal of Business and Economics*, 6(2), pp. 19-36. doi: 10.37284/eajbe.6.2.1540.

IEEE CITATION

S., Anyisile, T., Kipilimba & H., Ng'elenge "Factors Influencing Effective Implementation of Public Sector E-procurement in Tanzania: A Case of TANROADS Iringa Regional Office", *EAJBE*, vol. 6, no. 2, pp. 19-36, Oct. 2023.

MLA CITATION

Anyisile, Subira, Theobald Kipilimba & Haji Ng'elenge. "Factors Influencing Effective Implementation of Public Sector E-procurement in Tanzania: A Case of TANROADS Iringa Regional Office". *East African Journal of Business and Economics*, Vol. 6, no. 2, Oct. 2023, pp. 19-36, doi:10.37284/eajbe.6.2.1540.

INTRODUCTION

Facing the global financial crisis has posed significant challenges for countries worldwide (World Bank, 2018). Governments around the world have been compelled to enhance their financial management strategies to promote transparency and accountability. The evolution of technology has presented an opportunity to harness the true potential of the Internet and streamline business operations. Each year, governments make efforts to improve their financial management in various ways, one of which is the adoption of e-procurement systems.

The global financial crisis of 2008 had far-reaching consequences that reverberated across nations, impacting their financial stability and governance. Governments worldwide found themselves compelled to reevaluate their financial management strategies to weather the crisis and ensure long-term economic sustainability (World Bank, 2018). In this context, the importance of transparency and accountability in public financial management became increasingly evident. To address these challenges, governments embarked on a quest for innovative solutions, turning to technological advancements as a means to enhance efficiency and transparency. Among these solutions, e-procurement emerged as a promising strategy to revolutionize public sector procurement practices. The global financial crisis was a turning point that prompted governments to seek innovative financial management strategies. The introduction of e-procurement represents a response to the need for enhanced transparency and efficiency in government operations. E-procurement, also known as electronic procurement, refers to the digitization of procurement processes in both the public and private sectors. It entails the use of electronic methods, such as the Internet, to facilitate transactions between government authorities and suppliers (Subramaniam& Shaw, 2017). The primary objective of this study was to assess the factors that influence the effective implementation of public sector e-procurement, using TANROADS Iringa as a case study. By conducting an in-depth analysis of the challenges and opportunities faced by TANROADS Iringa in adopting e-procurement practices, this study aimed to provide valuable insights that can inform policy and decision-making not only within the organization but also at the broader national level. These insights can contribute to the development of strategies and interventions that can be tailored to the unique needs of Tanzanian public sector entities, with the ultimate goal of enhancing transparency, efficiency, and accountability in procurement processes.

Moreover, the findings of this research anticipated broader implications for the entire Tanzanian public sector. By shedding light on the intricacies of e-procurement adoption within a regional office like TANROADS Iringa, the research aims to provide valuable guidance for other public sector organizations facing similar challenges. It seeks to contribute to the development of a roadmap for successful e-procurement adoption in Tanzania, aligning with the government's vision of transparent and efficient public procurement practices. This research aimed to bridge the gap between e-procurement theory and practice within the Tanzanian context. It addresses the specific challenges and opportunities faced by TANROADS Iringa while also serving as a

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

blueprint for broader public sector e-procurement adoption in Tanzania.

Statement of the Problem

Electronic Procurement System (EPS) is recognized as a powerful tool for enhancing the procurement function in organizations, spanning both the public and private sectors. Leveraging the capabilities of the Internet, an electronic procurement system streamlines and improves various stages of the procurement process. These stages encompass searching for suppliers, processing product requests, obtaining approvals, generating orders, controlling the procurement process, and coordinating the exchange of information both internally and externally with trading partners.

The benefits of EPS adoption are substantial. Research has indicated that EPS implementation can lead to cost savings through reduced transaction costs, improved procurement process quality (accuracy), shortened cycle times, enhanced inventory management, and strengthened relationships with trading partners (Subramaniam and Shaw, 2017; Muffatto & Payaro, 2018). Additionally, it enables better risk control and the exploitation of strategic sourcing opportunities.

Despite the evident advantages of EPS adoption, the reality falls short of the initial predictions. The adoption rate of electronic procurement systems has not matched the early expectations (Da Vila et al., 2019). Realizing the more advanced applications of EPS may remain elusive until substantial improvements are made in the underlying infrastructure.

The Government of Tanzania, along with other pioneers in the field, has exerted considerable efforts to encourage entities to embrace e-procurement as a means to enhance the procurement function. However, there has been a noticeable dearth of comprehensive studies on the factors influencing effective e-procurement implementation in the public sector, particularly within entities like TANROADS Iringa (Amani, 2020). To date, no specific study has been conducted to explore these factors in the context of TANROADS Iringa.

Hence, the central question that arises is how the electronic procurement system can be effectively equipped to foster successful implementation within the public sector, particularly in an organization like TANROADS Iringa. The researcher intended to undertake an in-depth assessment of the factors that influence the effective implementation of e-procurement within the public sector, with a specific focus on TANROADS Iringa. By addressing this critical research gap, the study aimed to provide valuable insights and recommendations that can facilitate the integration of e-procurement systems in TANROADS Iringa and potentially serve as a model for broader adoption within the Tanzanian public sector. The study aimed to bridge this research gap and provide actionable insights for improving EPS adoption within the Tanzanian public sector by assessing the factors influencing the effective implementation of e-procurement in the public sector at TANROADS Iringa.

Research Objectives

General Objective

The general objective of this study was to assess factors influencing the effective implementation of public sector e-procurement in Tanzania, the case of TANROADS Iringa regional office.

Specific Objectives

- To determine the influence of e-infrastructure on effective implementation of e-procurement at TANROADS Iringa
- To determine the influence of staff competence on effective implementation of e-procurement at TANROADS Iringa
- To determine the influence of management support on the effective implementation of e-procurement at TANROADS Iringa

THEORETICAL FRAMEWORK

Innovation Diffusion Theory

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

The Innovation Diffusion Theory has played a pivotal role in understanding the adoption of new technologies (Parasuraman, 2010). This theory provides a structured framework for predicting the time required for a technological innovation to gain acceptance within a given context. It is composed of key constructs that encompass the characteristics of the innovation itself, the communication networks that facilitate its diffusion, and the attributes of the individuals or entities adopting the innovation. This theory has evolved since its inception in the 1940s and provides a structured approach to predicting the rate and extent of technology acceptance within a given social system. The key constructs of Innovation Diffusion Theory are innovation and adopters. The theory recognizes that individuals or entities within a social system adopt innovations at different rates. Adopters are classified into several categories based on their willingness to adopt early or later in the innovation diffusion process. These categories include innovators, early adopters, early majority, late majority, and laggards (Rogers, 1962). Other constructs are communication networks, management support, e-infrastructure, staff competence, and management support. The Innovation Diffusion Theory provides a comprehensive framework for understanding technology adoption and innovation diffusion, shedding light on how factors such as staff competence, management support, and infrastructure play integral roles in the effective implementation of e-procurement systems within public sector organizations like TANROADS Iringa. It offers a robust foundation for examining the complexities of technology adoption within the study's specific context.

EMPIRICAL LITERATURE REVIEW

Influence of E-Infrastructure on the Effectiveness of E-procurement

Koriret et al. (2015), in the study titled "Influence of Effective Implementation of E-procurement in the Public Sector: A Survey of Selected Government Ministries in Kenya". The study examined the drivers of e-procurement, benefits, and constraints to effective implementation of public sector e-procurement. The study was a cross-sectional survey using heads of procurement units from the selected ministries, who are also the secretaries of the Ministerial Tender Committees. A sample of 16 ministries, which represented 51.6% of the whole population, was selected at random. Data was collected through questionnaires with both closed and open-ended questions. Frequencies, Mean, standard deviations and percentages were used to present data. The findings of the study reveal that technological drivers such as secure transactions, integration of websites to all business processes, adequate resources and appropriate supporting ICT infrastructure are the major factors in the effective implementation of e-procurement in most ministries in Kenya. The study further found other factors such as effective project implementation leadership supported by appropriate human resources capacity, forming alliances with suppliers, technology providers, customers, appropriate organizational structure, budget support, government policy on ICT, human resources capacity, and the legal framework also influence effective e-procurement.

Influence of Staff Competence on the Effectiveness of E-procurement

Obat (2017) did a study on Critical Success Factors in the implementation of e-procurement in public entities in Kisumu County in Kenya. The study assumed a descriptive research design. The target population was composed of procurement professionals in Kisumu County. The study found that staff training on e-procurement tools, allocation of adequate resources on e-procurement, top management support towards e-procurement implementation, early supplier involvement during e-procurement implementation and reliable internet service provider were critical when rolling out the e-procurement system in public entities. The study identified the factors that act as prerequisites to the implementation of e-procurement change of a reliable internet service provider. The study recommended that staff training on e-procurement

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

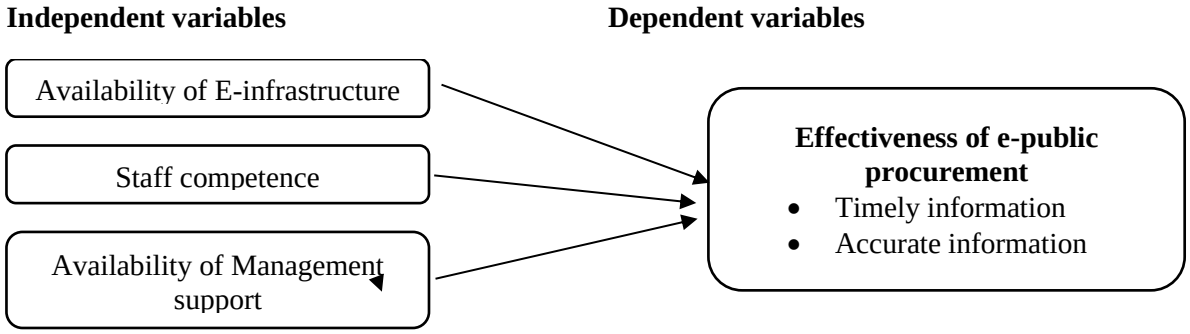
should be given much more emphasis and that e-procurement be given priority during the planning and budgeting process.

Influence of Management Support on the Effectiveness of E-procurement

Thiga and Makau (2016), in the study titled "Factors influencing adoption of electronic procurement in the public sector. The study used selected government agencies. The study intended to investigate to which extent e-security, staffing, user acceptance and top management support affect the adoption of e-procurement. A descriptive research design was adopted for the study where all the government agencies (122) that are registered in Kenya formed the target population for the study. The study considered a sample of 18 government agencies from which 54 respondents were purposively selected. Questionnaires were used to collect primary data from procurement managers and procurement officers. From the study, it was noted that e-procurement has not been fully adopted by all government agencies. Top management support and e-security are the major influences on e-procurement adoption/implementation. The study recommended that top management support among parastatals should set goals, strategies and baselines that are necessary for the adoption of the e-procurement and follow-up to ensure implementation.

Conceptual Framework

Figure 1: Conceptual Framework for Factors influencing Effective implementation of Public Sector E-procurement



Source: Researcher, (2023)

Operationalization of Key Concepts

Table 1: Operationalization of Variables

Variable	Variable measurement	Scale measurements	Expected relationship
E-Infrastructure	● Availability of hardware and software ● Reliable network ● IT support personnel ● E-system ● Availability of computers	Ordinal scale	Information Technology Infrastructure influences the effective implementation of e-procurement.
Staff competence	● IT Skills ● Staff Knowledge ● Commitment ● Experience ● Education level	Ordinal scale	Staff competence is positively related to the effective implementation of e-procurement.
Management support	● Provision of enough IT infrastructure ● Training provision ● Mentoring	Ordinal scale	Management support is a positively effective implementation of e-procurement.

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

Variable	Variable measurement	Scale measurements	Expected relationship
	● Prompt maintenance ● Provision of technical expertise		
Effective implementation of e-procurement	● Timely provision of information ● Accurate information provided by the system	Ordinal Scale	User competence, management support and information technology infrastructure influence the effective implementation of e-procurement.

Source: Empirical literature review

RESEARCH METHODOLOGY

Description of Study Area

The study focussed on the Tanzania National Roads Agency (TANROADS) Iringa regional branch. Iringa is among the fastest-growing regions in Tanzania. TANROADS is an executive agency which was established in 2000 with responsibilities of maintenance and development of national roads in Tanzania's mainland, which covers 13000 kilometres. TANROADS was selected as a government agency since its operations are based on the procurement processes.

Study Population

The target population is defined as a universal set of studies of all members of a real or set of people, events or subjects to which an investigator generates results (Mugenda& Mugenda, 2003). The population were ninety-five (95) employees from seven (7) different departments and uni sections (Human Resource Office, 2023), as shown in *Table 1*.

Table 1: Population of the study

Departments	Number of staffs	Total (%)
Accounts and administration	23	25%
Weighbridge unit	42	45%
Procurement management unit	5	5%
Planning unit	4	4%
Material laboratory unit	8	9%
Maintenance unit	11	10%
Development unit	2	2%
Total	95	100%

Source: Regional Manager TANROADS Iringa

Research Approach

The study employed a quantitative approach to describe factors influencing the effective implementation of e-procurement. This method's objective is to firm up and modify knowledge gained in a fundamentally quantitative way, which is consistent with the research objectives (Koech *et al*., 2016). The quantitative research approach was employed during the collection of quantitative data from users of the e-procurement in TANROADS Iringa Municipality through the use of a Likert scale questionnaire.

Research Design

This study employed a descriptive research design, which is concerned with finding out who, where, what, and how much a phenomenon, which is a concern of the study (Babbie, 1998). According to Kothari (2004), a descriptive design involves the development, organizing, compilation and analysis of data so as to offer the information being sought. Descriptive design was prioritized in this study because it helped in describing the distribution of phenomena in a population and in establishing facts since the data

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

will be holistic, contextual and in-depth (Koech *et al*., 2016).

Sample Size and Sampling Techniques

Sample Size

The sample is a segment of the population in which the researcher was interested in gaining information and drawing conclusions. A sample size representative is selected using both purposive and simple random sampling. The sample for this study was 80, as obtained from Krecjie and Morgan's table below if you have a population of 95, the required sample size is 80 respondents, as shown below in *Table 2.*

Table 2: Sample size determinations from a given population at a confidence level of 95%

N	S	N	S	N	S
35	32	220	140	1200	291
40	36	230	144	1300	297
45	40	240	148	1400	302
50	44	250	152	1500	306
55	48	260	155	1600	310
60	52	270	159	1700	313
65	56	280	162	1800	317
70	59	290	165	1900	320
75	63	300	169	2000	322
80	67	320	175	2200	327
85	72	340	181	2400	331
90	76	360	186	2600	335
95	80	380	191	2800	338
100	84	400	196	3000	341

Source: Krejcie and Morgan (1970)

Where *N* is the population size, and *S* is the sample size.

Type and Source of Data

Primary Data

Primary data is composed of the information gathered directly from participants (Mlyuka, 2015). In addition, primary data can be expressed as the first information collected through various methods.

Data Collection Method

Questionnaire

Data collection for the study was done using questionnaires attached, which were designed based on research objectives. The use of questionnaires intends to capture data for identifying factors which are helpful in explaining their influence on effective e-procurement in the public sector. This method is easy to administer and unbiased (Mlyuka, 2015).

Data Analysis

This is the process of evaluating data using analytical and logical reasoning to examine each component of the data provided. Data from various sources is gathered, reviewed, and then analyzed to form some sort of finding or conclusion (Kothari,2014). The study employed descriptive statistics in data analysis. Quantitative data were analysed using descriptive statistical analysis. SPSS was used whereby frequencies, percentages, mean and standard deviation were generated to determine the relative importance of the quality dimensions as viewed by respondents. SPSS was employed because it is a computer software package used for conducting statistical analyses, manipulating data and generating statistical proof. In addition, multicollinearity and regression analysis were used to determine the relationship between Effective implementation of e-procurement as the dependent variable and e-infrastructure, staff competence and management support as independent variables.

RESULTS

Respondents Demographic Characteristics

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

Table 3: Respondents' Profile

		Frequency	Per cent
Respondents' gender	Male	48	60.0
	Female	32	40.0
	Total	80	100.0
Respondents Age	18-30	33	41.3
	31- 40	21	26.0
	41-50	17	21.3
	51 and above	9	11.3
	Total	80	100.0
Respondents Education	Certificate	9	11.3
	Diploma	35	43.8
	Bachelor degree	29	36.3
	Masters 'degree	7	8.8
	Total	80	100.0
Work Experience	0-5 year	12	15.0
	6-10 years	28	35.0
	11-15 years	23	28.7
	16-20 years	11	13.8
	Above 20 years	6	7.5
	Total	80	100.0

Source: Field data (2023)

Influence of E-Infrastructure on Effective Implementation of E-procurement

Regarding the influence of e-infrastructure on effective implementation, the study focuses on the availability of enough computers for e-procurement activities, network stability, availability of staff with IT skills and availability of enough hardware and software for e-procurement implementation. Results in Table 4 revealed that availability of computers for e-procurement activities scored a mean of 3.48 with Standard Deviation (SD= 1.180, Stable network availability mean of 3.80 (SD=1.130), Staff with IT skills for e-procurement activities score a mean of 2.88 (SD=1.036), availability of hardware and software for e-procurement activities 3.81 (SD=1.068) and reliable e-system that supports e-procurement 3.90 (SD=1.077).

These findings imply that at TANROADS Iringa, there is enough computer for e-procurement activities, stable network availability, hardware and software for procurement activities and a reliable e-system that supports e-procurement activities. The findings also imply that staff with IT skills for e-procurement activities are not enough as the mean of 2.88 is less than the cut-off point of 3.00, this is a clear indication that there is a need to increase their number so as to enhance effective implementation of e-procurement.

Table 4: E-infrastructure

	N	Mean	Std. Dev	Std. Error Mean
TANROADS has enough computers for E-procurement activities	80	3.48	1.180	.132
TANROADS has stable network availability	80	3.80	1.130	.126
Staff with IT skills are available for E-procurement activities	80	2.88	1.036	.116
TANROADS has enough hardware and software for e-procurement programs	80	3.81	1.068	.119
TANROADS has enough reliable e-systems that support e-procurement	80	3.93	1.077	.120

Source: Field data (2023)

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

This section delves into the findings related to the first research objective, which is to assess the influence of e-infrastructure on the effective implementation of e-procurement within TANROADS Iringa. The study examines several aspects of e-infrastructure, including the availability of computers, network stability, the presence of staff with IT skills, and the accessibility of hardware and software for e-procurement activities.

Availability of Computers for E-procurement Activities:

The study's findings indicate that the availability of computers for e-procurement activities received a mean score of 3.48, with a Standard Deviation (SD) of 1.180. This suggests that TANROADS Iringa has made considerable strides in ensuring that there are enough computers to support e-procurement activities. This positive score implies that the organization recognizes the importance of adequate hardware resources in facilitating the adoption and implementation of e-procurement processes.

Stable Network Availability

In terms of network stability, the study reveals a mean score of 3.80 (*SD* = 1.130). This indicates that TANROADS Iringa boasts a stable network infrastructure, which is a crucial component of effective e-procurement implementation. A reliable network ensures seamless communication and data transfer, underpinning the efficiency and effectiveness of e-procurement operations.

Staff with IT Skills for E-procurement Activities

However, the findings also bring to light a potential area for improvement. The mean score for the availability of staff with IT skills for e-procurement activities stands at 2.88 (*SD* = 1.036). This score falls below the cut-off point of 3.00, signalling that there is a shortage of personnel with the necessary IT competencies to support e-procurement endeavours. To enhance the effective implementation of e-procurement, TANROADS Iringa should consider investing in IT training and recruitment to bolster the skill set of its workforce in this domain.

These findings align with the study done by Korir et al. (2015), who found technological drivers such as secure transactions, integration of websites to all business processes and adequate resources and appropriate supporting ICT infrastructure to be the major factors in effective implementation of e-procurement in most ministries in Kenya. The study further found other factors such as effective project implementation leadership supported by appropriate human resources capacity, forming alliances with suppliers, technology providers, customers, appropriate organizational structure, budget support, government policy on ICT, human resources capacity, and the legal framework also influence effective e-procurement.

Furthermore, Boateng and Asare (2017) pointed out that the ICT infrastructure in the Technical Universities was not adequate. Similarly, a study by Afolabi et al. (2018) titled "Critical Success Factors for e-procurement Adoption in the Nigerian Construction Industry" revealed management support for physical infrastructure and human factors and characteristics of the technology are crucial for the adoption of e-procurement systems in the Nigerian construction industry.

Influence of Staff Competence on Effective Implementation of E-procurement

results in *Table 5* e-procurement scored a mean of 2.69 with a standard deviation of 2.074, knowledge on e-procurement with a mean of 3.80 (*SD* = 1.130), the commitment of staff on e-procurement usage with a mean of 3.75 (*SD* = 1.108), experience on e-procurement scored a mean of 3.99 (*SD* = 1.049) and education level scored a mean of 3.90 (*SD* = 1.074). These findings imply that at TANROADS, employees have a low level of IT skills to enhance effective implementation of e-procurement but are knowledgeable on e-procurement, very committed to using e-procurement and have enough education level to use e-procurement. It

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

also implies that knowledge and education are necessarily required in order to ensure effective implementation of e-procurement. These findings are in line with Innovation theory, which postulates that knowledge regarding e-procurement, as well as education and experience, are the prime determinants of effective implementation of e-procurement. These findings also suggested that ineffective implementation of e-procurement was attributed to limited IT skills among employees. It is important to note that ICT skills play a crucial role in the implementation of e-procurement. Thus, procurement officers with adequate ICT skills are expected to be more competent in using the system than their unskilled counterparts.

Table 5: Staff competence

	N	Mean	Std Dev.	Std. Error
My IT skills influence me to use effective e-procurement in my organization	80	2.69	2.074	.120
I have the best knowledge of how to use e-procurement effectively in my organization	80	3.80	1.130	.126
Due to my competence, I am committed to using e-procurement effectively in my organization	80	3.75	1.108	.124
I have more experience in using e-procurement effectively in my organization	80	3.99	1.049	.117
My education level influences me to use e-procurement effectively in my organization	80	3.90	1.074	.120

Source: Field data (2023)

This section explores the findings related to the second research objective, which assesses the influence of staff competence on the effective implementation of e-procurement within TANROADS Iringa. The various facets of staff competence are examined as follows:

IT Skills

The findings indicate that the influence of IT skills on the ability to perform e-procurement activities scored a mean of 2.69 with a Standard Deviation (SD) of 2.074. This result suggests that TANROADS employees have relatively low levels of IT skills in facilitating effective e-procurement implementation. The IT skills enable employees to navigate and utilize e-procurement systems effectively.

E-procurement Knowledge

The level of knowledge about e-procurement among employees had a mean of 3.80 (*SD* = 1.130). This indicates that TANROADS employees possess a commendable understanding of e-procurement concepts and practices. Knowledge about e-procurement is a fundamental prerequisite for its effective implementation, as it ensures that employees are well-informed and capable of making informed decisions within the system.

Commitment of Staff on E-procurement Usage

Furthermore, the commitment of staff to the usage of e-procurement scored a mean of 3.75 (*SD* = 1.108). This finding highlights the dedication of TANROADS employees to the adoption and consistent use of e-procurement practices. Commitment among staff is a crucial factor in the successful implementation of e-procurement, as it fosters a culture of continuous improvement and innovation.

Experience on E-procurement

The study's results also point to the influence of experience with e-procurement, with a mean score of 3.99 (*SD* = 1.049). This suggests that TANROADS employees have accumulated substantial experience in working with e-procurement systems. Experience plays a vital role in enhancing competence, as it allows employees to become more adept at navigating and utilizing e-procurement platforms.

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

Education Level of Procurement Officers

The education level of procurement officers was found to have a mean score of 3.90 (*SD* = 1.074). This signifies that TANROADS employees possess a significant level of education, which is an essential factor in ensuring the effective implementation of e-procurement. A well-educated workforce is better equipped to comprehend complex systems and adapt to technological innovations.

In conclusion, the findings regarding staff competence align with existing literature, reinforcing the critical role of staff training, resource allocation, top management support, early supplier involvement, and reliable internet service providers in effective e-procurement implementation. Additionally, the study highlights the importance of e-procurement knowledge, experience, and commitment among staff, as these factors significantly contribute to successful e-procurement outcomes.

Influence of Management Support on Effective Implementation of E-procurement

The first statement in *Table 6*, **"**TANROADS has enough Information and Communication Technology Infrastructure,**"** received an average score of 3.89, indicating that, on average, respondents perceive that TANROADS in Iringa possesses sufficient ICT infrastructure to support their operations. This relatively positive assessment suggests that the organization has invested in the necessary technological resources to facilitate its activities. However, it**'**s important to note that the standard deviation of 1.091 implies some variability in responses, with some respondents rating this aspect more favo**u**rably and others less favo**u**rably, which may suggest that there is room for improvement or that experiences with the infrastructure vary among respondents.

The second statement, "There is availability of user manuals for Staff and mentoring to use e-procurement," received an average score of 3.73. This suggests that, on average, respondents believe there is at least some availability of user manuals and mentoring to help staff use e-procurement systems effectively. However, the relatively wide standard deviation of 1.136 implies that there is considerable variation in respondents**'** opinions. Some may have had better experiences with available support, while others may perceive a lack of guidance or training resources. This indicates a potential need for standardizing and improving training and mentoring programs.

Regarding the statement **"**Management set enough budget for training,**"** it received an average score of 3.75, implying that, on average, respondents feel that management allocates an adequate budget for training. This suggests a positive sentiment toward the organization**'**s commitment to staff development. Nevertheless, the standard deviation of 1.119 indicates that there is some diversity in responses, meaning that some respondents may view the training budget as sufficient, while others may think it falls short. This variance could indicate room for aligning training budgets more closely with the needs and expectations of the workforce.

The fourth statement, "Management promptly provides maintenance services in case system errors occur," received an average score of 3.86. This suggests that, on average, respondents believe that management responds swiftly to system errors by providing maintenance services. This is generally a positive sign, indicating that the organization is responsive to technical issues. However, the standard deviation of 1.099 suggests that some respondents may have had more favourable experiences with prompt maintenance, while others may not have been as satisfied. This variance could be an opportunity for TANROADS to further enhance its maintenance services and ensure consistency in addressing system errors.

Lastly, the statement "Management provides technical support when needed" received an average score of 3.81, indicating that, on average, respondents feel that management provides the necessary technical support when it's required. This reflects positively on the organization's

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

ability to assist staff in resolving technical issues. However, the standard deviation of 1.068 implies that there is variation in experiences, with some respondents having more positive interactions with technical support than others. To enhance the overall user experience, TANROADS could aim for a more consistent provision of technical support. In summary, these results indicate that, on average, TANROADS in Iringa is perceived to have reasonably good management support in terms of ICT infrastructure, user manuals, budget allocation for training, prompt maintenance services, and technical support. However, the variability in responses suggests areas where the organization may need to focus on improving consistency and addressing the diverse experiences of its staff. This feedback can be valuable for TANROADS to make targeted improvements and ensure a more uniform and positive experience for its workforce.

Table 6: Management Support

Statements	N	Mean	Std Dev.	Std. Error
TANROADS has enough Information and Communication Technology Infrastructure	80	3.89	1.091	.122
There is a user manual for staff and mentoring to use e-procurement	80	3.73	1.136	.127
Management set enough budget for training	80	3.75	1.119	.125
Management promptly provides maintenance services in case system errors occur	80	3.86	1.099	.123
Management provides technical support when needed	80	3.81	1.068	.119

Source: Field data (2023)

The influence of management support on the effective implementation of e-procurement encompassed the following:

ICT Infrastructure

One of the critical components assessed was the availability of Information and Communication Technology (ICT) infrastructure. The results indicate that TANROADS possesses sufficient ICT infrastructure, as reflected in the mean score of 3.89. This underscores the importance of having a robust technological foundation to support e-procurement activities. Adequate ICT infrastructure ensures that the necessary hardware and software are in place to facilitate the smooth functioning of e-procurement processes.

Maintenance Services and Technical Support

The study also revealed favourable results concerning the maintenance of e-procurement systems. Management's prompt provision of maintenance services in case of system errors, with a mean score of 3.86, highlights the commitment to ensuring the reliability and functionality of e-procurement systems. Additionally, management's provision of technical support when needed, with a mean score of 3.81, further reinforces the organization's dedication to addressing potential issues promptly.

Regression Analysis

Model Summary

Regression analysis is a statistical method used to explore the relationship between one or more independent variables and a dependent variable. In this section, the study examines the results of the regression analysis conducted to understand the relationship between the culture parameter and the effective implementation of e-procurement in the public sector at TANROADS Iringa.

Table 7 shows the Regression Adjusted R-squared value to be 65.3%. This value is significant as it indicates the proportion of the variation in effective e-procurement implementation that is explained by the culture parameter. Specifically, it suggests that the specified model, which includes the culture parameter as an independent variable, accounts for approximately 65.3% of the

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

variability in the effective implementation of e-procurement.

The interpretation of this R-squared value is as follows: A higher R-squared value indicates a better model fit, and an R-squared greater than 50% is generally considered a good fit. In this context, with an adjusted R-squared of 65.3%, the model is deemed to provide a good representation of the relationship between the culture parameter and effective e-procurement implementation.

In summary, the regression analysis results reveal that the culture parameter, comprising various cultural factors, has a substantial influence on the effective implementation of e-procurement in the public sector at TANROADS Iringa. The model demonstrates a strong fit, and approximately 65.3% of the variation in effective e-procurement implementation can be attributed to cultural factors included in the culture parameter. This underscores the importance of cultural considerations in the successful implementation of e-procurement initiatives.

Table 7: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.746[a]	.657	.653	.725

a. Predictors: (Constant), e-infrastructures, staff competence and management support

Source: Field data (2023)

Analysis of Variance (ANOVA)

In ANOVA, the p-value associated with the analysis helps researchers assess the statistical significance of the factors being analysed. In *Table 8,* it is reported that the p-value is 0.000.

A p-value of 0.000 indicates an extremely low probability that the observed differences between the means are due to random chance alone. In other words, it suggests a highly significant relationship or influence between the factors being analysed (e-infrastructures, staff competence, and management support) and the effective implementation of e-procurement.

When the p-value is very close to zero, as in this case, it typically implies that the differences observed are not likely to have occurred by random variation. Instead, they are likely the result of the factors being analysed exerting a real and significant influence on the effective implementation of e-procurement.

The fact that the p-value is 0.000 indicates strong statistical evidence supporting the assertion that e-infrastructures, staff competence, and management support have a substantial impact on the effective implementation of e-procurement. These factors are not mere coincidences but are indeed influencing the outcome in a meaningful way.

With a p-value of 0.000, the significance level is far below the conventional threshold of 0.05. Therefore, it is safe to conclude that the influence of e-infrastructures, staff competence, and management support on effective e-procurement implementation is highly significant.

This reinforces the importance of these factors in the successful execution of e-procurement initiatives in the public sector at TANROADS Iringa.

Table 8: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	186.833	3	62.278	158.555	.000[b]
	Residual	148.865	53	.393		
	Total	335.697	56			

a. Dependent Variable: Effective implementation of e-procurement.
b. Predictors: (Constant), e-infrastructures, Staff competence and Management support

Source: Field data (2023)

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

Significance of Regression Analysis Output

The results of the regression analysis are critical in assessing the relationships between different factors and the effective implementation of e-procurement. In this context, the p-values associated with specific variables help determine the significance of these relationships.

Based on E-Infrastructure, the study found that e-infrastructure has a significant positive effect on the effective implementation of e-procurement, as indicated by a p-value of 0.028. This p-value is less than the conventional significance level of 0.05 (5%). Therefore, it suggests that e-infrastructure is a statistically significant factor influencing the success of e-procurement implementation. The positive correlation implies that improvements or investments in e-infrastructure can lead to better e-procurement outcomes. On the other side, the staff competence**,** similarly, staff competence was found to have a significant positive relationship with effective e-procurement implementation, with a p-value of 0.032. Again, this p-value is less than 0.05, reinforcing the notion that staff competence is a statistically significant factor affecting the success of e-procurement initiatives. This finding underscores the importance of having skilled and knowledgeable staff members for the successful implementation of e-procurement systems. Moreover, management support stated that the analysis also revealed that management support significantly influences the effective implementation of e-procurement, with a p-value of 0.015. As with the previous factors, this p-value falls below the 0.05 onset, emphasizing the statistical significance of management support. It implies that when management is actively supportive of e-procurement initiatives, it contributes positively to their success.

Table 9: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.055	3.527		6.538	.000
	e-infrastructure	0.203	.107	.241	1.895	.028
	Competence	0.298	.135	.278	2.205	.032
	Management support	0.188	.120	.195	1.565	.015

a. Dependent Variable: Effective implementation of e-procurement

CONCLUSION AND RECOMMENDATIONS

Conclusion

Influence of E-Infrastructure on Effective Implementation of E-procurement

E-infrastructure constitutes the backbone of any e-procurement system. It encompasses the technological elements necessary for the operation of electronic procurement processes. The findings of this study unequivocally indicate that e-infrastructure plays a pivotal role in the effective implementation of e-procurement.

At TANROADS Iringa, the state of e-infrastructure was found to be robust and well-established. The organization has commendably invested in key components of e-infrastructure, including the availability of an adequate number of computers dedicated to e-procurement activities, stable and reliable network connectivity, access to essential hardware and software, and a dependable e-system that underpins e-procurement operations. These achievements signify a substantial commitment to modernizing and streamlining procurement procedures.

To bridge the IT skills gap, organizations like TANROADS Iringa should prioritize continuous training and capacity-building programs. These initiatives should not only focus on improving general IT skills but also provide specialized training related to e-procurement tools and processes. Furthermore, nurturing a culture of digital literacy among staff can enhance their

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

overall competence and confidence in using e-procurement systems.

Influence of Staff Competence on Effective Implementation of E-procurement

Staff competence emerges as a critical factor influencing the effective implementation of e-procurement. Competent staff members are more likely to navigate the complexities of e-procurement systems, making them indispensable assets in the transition to electronic procurement processes.

The study's findings indicate that employees at TANROADS Iringa exhibit a high level of commitment to e-procurement activities. They are knowledgeable about e-procurement and its associated benefits, and they demonstrate a commendable level of education. These attributes are indeed promising and indicative of a workforce that is receptive to technological advancements and the adoption of modern procurement practices.

However, despite this positive disposition, the study highlights a notable deficiency in IT skills among staff members. This apparent gap in technical competencies raises concerns about the ability of employees to fully exploit the capabilities of e-procurement systems. Effective e-procurement requires not only theoretical knowledge but also practical proficiency in utilizing the digital tools and platforms integral to the procurement process.

To bolster staff competence, organizations should prioritize training programs that target specific IT skills relevant to e-procurement. These programs should be tailored to accommodate both novice and experienced users, catering to the diverse needs of the workforce. Additionally, the promotion of knowledge sharing and peer-to-peer learning can facilitate the exchange of best practices and practical insights among employees.

Influence of Management Support on Effective Implementation of E-procurement

Management support emerges as a critical determinant of successful e-procurement implementation. Without the backing of top management, initiatives to transition to electronic procurement practices may face insurmountable challenges. The findings of this study underscore the significant role played by management in supporting e-procurement endeavours at TANROADS Iringa. Management has demonstrated a proactive approach to e-procurement, evident in several aspects:

Information and Communication Technology Infrastructure: TANROADS Iringa has invested in establishing and maintaining a robust ICT infrastructure, including the provision of essential hardware, software, and reliable network connectivity. This investment is a clear indication of management's commitment to creating an enabling environment for e-procurement.

User Manuals and Mentoring: The availability of user manuals and mentoring programs for staff underscores management's dedication to facilitating staff members' transition to e-procurement processes. These resources serve as invaluable guides for employees as they navigate the intricacies of electronic procurement.

Budgetary Allocation: Management's commitment is further exemplified by the allocation of budgets specifically earmarked for staff training. This financial support ensures that employees receive the necessary training and skill development opportunities to enhance their competence in e-procurement.

To further enhance management support, organizations should continue to allocate resources to sustain and improve e-procurement systems. Regular assessments and audits of the ICT infrastructure can help identify areas for improvement. Additionally, maintaining open lines of communication with staff and addressing their concerns and feedback can foster a collaborative environment conducive to successful e-procurement implementation.

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

Recommendations

To the Government and Policy Makers

It is imperative for the government and policymakers to prioritize continuous training and capacity-building programs for public sector employees. These programs should focus on improving IT skills and enhancing e-procurement knowledge. Given the strong correlation between these variables and effective e-procurement implementation, regular training initiatives can bridge skill gaps and foster a more tech-savvy workforce.

Nurturing employee commitment is essential for the success of e-procurement initiatives. The government and policymakers should encourage organizations to recruit and retain personnel who are genuinely dedicated to their roles. This can be achieved by treating employees fairly, ensuring prompt payments and rewards, promoting work-life balance, providing opportunities for career advancement, and fostering healthy work relationships. A motivated and committed workforce is more likely to embrace e-procurement practices.

Policymakers should consider reviewing existing procurement policies to align them with the goals of e-procurement. These policies can be used to mandate and support frequent training of employees in relevant IT skills, encourage experience-sharing, enhance technological features, provide sufficient support to employees, and promote the recruitment of qualified ICT personnel. Additionally, motivation policies should be revisited to incentivize staff commitment to e-procurement objectives.

Recommendations to TANROADS Management

TANROADS should actively promote experience sharing among its employees. Given the strong correlation between experience and effective e-procurement implementation, creating an environment where junior staff work closely with senior counterparts can be highly beneficial. This collaboration allows novice users to gain valuable skills and insights from their more experienced colleagues, addressing challenges and facilitating smoother e-procurement adoption.

To ensure compatibility and ease of use, TANROADS should invest in versatile and upgradable technology solutions. Compatibility can be improved by adopting systems that provide clear instructions for operation, data input, and output interpretation. Technological enhancements should align with the evolving needs of e-procurement processes and support the organization's digital transformation journey.

TANROADS management should allocate sufficient financial resources to procurement units. This financial support should cover the procurement of necessary hardware, software, and support components. Additionally, funds should be allocated for training employees and enhancing their psychological well-being to boost commitment. Importantly, TANROADS should consider recruiting sufficient and well-qualified ICT personnel responsible for in-house system maintenance. These specialists can play a critical role in ensuring the continuous operation, maintenance, and updates required for e-procurement success.

Recommendations for Areas of Future Studies

Future research in the field of e-procurement implementation should consider investigating additional drivers beyond the scope of this study. While this research focused on e-infrastructure, staff competence, and management support, there are likely other influential factors that warrant exploration. Conducting comprehensive studies that encompass a broader range of determinants can provide a more holistic understanding of the complexities involved in effective e-procurement implementation.

Assessing the impact of government policies on e-procurement implementation is a crucial area for future investigation. Researchers can examine how policy changes and mandates influence the adoption and success of e-procurement initiatives. Understanding the policy landscape and its implications can inform policymakers and

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

organizations seeking to align their practices with government directives.

In conclusion, this study provides a foundation for future research endeavours in the realm of e-procurement within the public sector. By addressing these recommendations, governments, organizations, and researchers can collectively contribute to the advancement of e-procurement practices and their transformative potential in the public sector.

REFERENCES

Afolabi, A., Ibem, E., Aduwo, E., Tunji-Olayeni, P., & Oluwunmi, O. (2019). Critical success factors (CSFs) for e-Procurement adoption in the Nigerian construction industry. *Buildings*, *9*(2), 47.

Boateng, G. O. (2021). *The usage of e-procurement systems and its impact on the performance of SMEs in Ghana* (Doctoral dissertation, Department of Supply Chain and Information Systems, Kwame Nkrumah University of Science and Technology).

Davila, A., Gupta, M., & Palmer, R. (2003). Moving procurement systems to the internet:: The adoption and use of e-procurement technology models. *European management journal*, *21*(1), 11-23.

DiMaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2), 147-160.

Hair Jr, J., Hair Jr, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage publications.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). Canonical correlation: A supplement to multivariate data analysis. *Multivariate Data Analysis: A Global Perspective*, 7th ed.; Pearson Prentice Hall Publishing: Upper Saddle River, NJ, USA.

Korir, S., Afande, F. O., & Maina, P. (2015). Constraints to Effective Implementation of E-Procurement in the Public Sector: A Survey of Selected Government Ministries in Kenya. *Journal of Information Engineering and Application*, *5*(4).

Kothari, C. R. (2014). *Research Methodology: Methods and Techniques* (3rd ed.). New Delhi: New Age International (P) Limited.

Mlyuka, S. (2015). *Qualitative Research Methods: Documentary Research.* London: Sage Publications Ltd.

Muffatto & Payaro, (2018). Strengths and challenges in the use of interpretive description: Reflections arising from a study of the moral experience of health professionals in humanitarian work. *Qualitative Health Research*, 19(9), 1284–1292.

Mugenda, O. M., & Mugenda, A. G. (2003). *Research methods: Quantitative & qualitative apporaches* (Vol. 2, No. 2). Nairobi: Acts press.

Obat, K.G. (2017). *Critical Success Factors in the implementation of e-procurement in public entities in Kisumu County in Kenya*. Master's Thesis. University of Nairobi.

Parasuraman, A. (2000). Technology Readiness Index (TRI) a multiple-item scale to measure readiness to embrace new technologies. *Journal of service research*, *2*(4), 307-320.

Rogers, E. M. (1962). *Diffusion of innovations*. New York: Free Press

Subramaniam, C., & Shaw, M. J. (2004). The effects of process characteristics on the value of B2B e-procurement. *Information Technology and Management*, *5*, 161-180.

Thiga, H. K., & Makau, G. (2016). Factors influencing adoption of electronic procurement in Kenyan public sector: a survey of selected government agencies. *Int. J. Sci. Res. Publ*, *6*(5), 453-459.

Article DOI: https://doi.org/10.37284/eajbe.6.2.1540

World Bank Group. (2018). *Global Economic Outlook 2018*. World Bank. https://www.worldbank.org/en/research/brief/global-economic-outlook

