



## East African Journal of Arts and Social Sciences

[eajass.eanso.org](http://eajass.eanso.org)

Volume 8, Issue 1, 2025

Print ISSN: 2707-4277 | Online ISSN: 2707-4285

Title DOI: <https://doi.org/10.37284/2707-4285>

EANSO

EAST AFRICAN  
NATURE &  
SCIENCE  
ORGANIZATION

Original Article

### Cost-effectiveness of Implementing E-government Strategies in Customs Clearance at Julius Nyerere International Airport in Tanzania

Solomon Simon Mhango, PhD<sup>1\*</sup> & Mwisi Kongo Zoma<sup>2</sup>

<sup>1</sup> Tengeru Institute of Community Development (TICD), P. O. Box 1006, Arusha, Tanzania.

<sup>2</sup> The Institute of Accountancy Arusha, P. O. Box 2798 Arusha, Tanzania.

\* Author's Email: [mhangos2004@yahoo.co.uk](mailto:mhangos2004@yahoo.co.uk)

Article DOI: <https://doi.org/10.37284/eajass.8.1.2862>

Date Published: **ABSTRACT**

11 April 2025

**Keywords:**

Cost Effectiveness,  
E-Government  
Strategies,  
Customs Clearance.

Digital transformation in customs clearance processes represents a critical shift in how governments modernize international trade operations and border control procedures. Thus, the current study examined the cost-effectiveness of implementing e-government strategies in customs clearance at Julius Kambarage Nyerere International Airport (JNIA). A qualitative research approach was employed for this study, whereby, a sample size of 26 respondents, including customs officials, airport management, traders, and passengers were subjected to interview questions. Primary tools for data collection included interviews and observations. Study findings established that e-government strategies impacted time efficiency in customs clearance. Herein, it was found that faster processing times have resulted in cost savings and as well increased revenues for JNIA in the customs department. Also, the findings revealed that there was an improvement in accuracy and fraud detection resulting from e-government systems. Denoting that automated checks within the system have allowed for immediate identification of inconsistencies and discrepancies, which were previously more challenging to detect with manual systems. Based on these foregoing findings, this study recommends that policymakers should address the occasional bottlenecks identified during the study, it is recommended that JNIA implement regular system maintenance and upgrades to minimize system downtime as well as ensure continuous training for customs officials on the use of e-government systems should be a priority.

#### APA CITATION

Mhango, S. S. & Zoma, M. K. (2025). Cost-effectiveness of Implementing E-government Strategies in Customs Clearance at Julius Nyerere International Airport in Tanzania. *East African Journal of Arts and Social Sciences*, 8(1), 447-455. <https://doi.org/10.37284/eajass.8.1.2862>

#### CHICAGO CITATION

Mhango, Solomon Simon and Mwisi Kongo Zoma. 2025. "Cost-effectiveness of Implementing E-government Strategies in Customs Clearance at Julius Nyerere International Airport in Tanzania". *East African Journal of Arts and Social Sciences* 8 (1), 447-455. <https://doi.org/10.37284/eajass.8.1.2862>

#### HARVARD CITATION

Mhango, S. S. & Zoma, M. K. (2025) "Cost-effectiveness of Implementing E-government Strategies in Customs Clearance at Julius Nyerere International Airport in Tanzania". *East African Journal of Arts and Social Sciences*, 8(1), pp. 447-455. doi: 10.37284/eajass.8.1.2862

#### IEEE CITATION

S. S., Mhango & M. K., Zoma "Cost-effectiveness of Implementing E-government Strategies in Customs Clearance at Julius Nyerere International Airport in Tanzania". *EAJASS*, vol. 8, no. 1, pp. 447-455, Apr. 2025.

#### MLA CITATION

Mhango, Solomon Simon & Mwisi Kongo Zoma. "Cost-effectiveness of Implementing E-government Strategies in Customs Clearance at Julius Nyerere International Airport in Tanzania". *East African Journal of Arts and Social Sciences*, Vol. 8, no. 1, Apr. 2025, pp. 447-455, doi:10.37284/eajass.8.1.2862.

## INTRODUCTION

Notably, airports across the world are increasingly adopting e-government strategies to streamline customs clearance processes and improve overall efficiency and one notable trend is the implementation of Automated Border Control (ABC) systems, which utilize biometric technology to facilitate faster processing of passengers (Al-Khouri, 2022). These systems enable travellers to self-check through e-gates using facial recognition or fingerprint scanning, reducing the need for manual intervention by customs officers (Jaffer & Timbrell, 2018). Additionally, many countries have introduced digital customs declarations, allowing passengers to submit their information electronically before arrival, this pre-arrival processing helps expedite clearance by pre-screening data and minimizing delays at the border (Amanbek, 2020).

In Africa, several airports are also embracing e-government strategies to enhance customs clearance, for instance, the African Union's initiatives aim to harmonize and standardize customs procedures across member states, promoting the adoption of electronic systems (Osei-Kojo, 2017). Airports like Johannesburg's OR Tambo International and Nairobi's Jomo Kenyatta International have introduced e-customs solutions to expedite processing and reduce congestion. These solutions include electronic cargo tracking systems and digital manifests that improve the efficiency of cargo handling and customs inspections (Ramadhan & Muigai, 2016). Moreover, some countries are developing regional

customs hubs to centralize and streamline cross-border trade processes, leveraging technology to facilitate faster and more secure clearance (Basu, 2020).

In Tanzania, the implementation of e-government strategies has notably improved the efficiency and effectiveness of customs clearances at airports. The Customs Management System (CMS) introduced by the Tanzania Revenue Authority (TRA) has streamlined the declaration process, reduced paperwork and speeding up the clearance of goods (Yusuf, 2016). This digital platform allows for faster processing of import and export documentation, enhancing overall operational efficiency at major airports like (KIA) Kilimanjaro International and Julius Nyerere International (Ramadhan & Muigai, 2016). The integration of biometric technology further accelerates passenger processing and enhances security, leading to shorter wait times and a more effective customs operation. These advancements have positively impacted both passenger experience and trade facilitation, supporting Tanzania's goal of becoming a more competitive player in the global economy (Basu, 2020).

In as much as there is evidence for the implementation of e-government strategies at the airports of various countries; including Johannesburg International Airport in South Africa (Osei-Kojo, 2017) and Jomo Kenyatta International Airport in Kenya, there is a dire need for understanding the e-government implementation practice in Tanzania. However, the specific impact of these e-government strategies at JNIA is not well-

documented. We do not have clear data on how these strategies have affected customs operations, such as processing times and user satisfaction, at this specific airport. Additionally, the unique challenges and barriers faced during the implementation of these strategies at JNIA, such as technical difficulties and staff readiness, are not fully understood. Therefore, the current study examined the cost-effectiveness of implementing e-government strategies in customs clearance at Julius Nyerere International Airport, in Dar es Salaam.

### **Objective of the Study**

The study examined the cost-effectiveness of implementing e-government strategies in customs clearance at Julius Nyerere International Airport.

### **Scope of the Study**

The scope of this study was confined to evaluating the e-government strategies implemented at Julius Nyerere International Airport (JNIA) in Dar es Salaam, specifically focusing on their effectiveness in enhancing customs clearance processes. The study assessed current e-government initiatives, their impact on customs efficiency and effectiveness, and the challenges encountered during their implementation. Data was collected from customs officials, stakeholders, and users of customs services at JNIA. The study did not cover other airports or entry points in Tanzania, nor did it delve into other aspects of e-government outside customs clearance. The timeframe for the evaluation was limited to the period since the implementation of the key e-government strategies at JNIA.

### **Significance of the Study**

The study is important for policymakers and stakeholders within JNIA and other airports in the country. As it aims to address challenges and opportunities in the implementation of e-government strategies in customs clearance at JNIA, the findings can be used to identify gaps in e-government implementation. Stakeholders can

capitalize on these gaps and implement policies that offer lasting solutions to improve this practice. The findings from this study can inform policymakers and stakeholders about the effectiveness of existing e-government initiatives, helping them make informed decisions on future improvements and implementations.

## **LITERATURE REVIEW**

### **Theoretical Literature Review**

This study adopted the Technology Acceptance Model (TAM), developed by Fred D. Davis in 1989, as a theoretical framework designed to understand and predict user acceptance of new technologies (Rafique et al., 2020). It focuses on two primary factors: perceived ease of use (PEOU), which is the extent to which users believe technology is free of effort, and perceived usefulness (PU), which is the extent to which users believe the technology enhances their job performance. Also, TAM helps to evaluate how these perceptions influence users' attitudes and intentions to adopt and use technological innovations, offering insights into improving technology adoption across various domains (Dahi & Ezziane, 2015). The Technology Acceptance Model (TAM) is used to understand how users come to accept and use technology. It posits that perceived ease of use and perceived usefulness are primary factors influencing users' acceptance of new technologies (Jaffer & Timbrell, 2018).

TAM is applied to explore how customs officials and travellers perceive and adopt e-government strategies at airports. For instance, evaluating whether the perceived ease of use and usefulness of Automated Border Control systems or digital customs platforms affects their efficiency in customs clearance. In the context of challenges, TAM can help identify barriers related to the perceived complexity of new systems or doubts about their effectiveness, which may hinder their implementation and widespread use.

## Empirical Literature Review

Riany (2021) carried out a study in Kenya in order to examine how e-government is determined by cost-effectiveness in its implementation of strategies in public service delivery of state agencies in the country. The study reviewed E-Commerce, E-Services and E-Administration. This foregoing study employed a descriptive research design to collect data from the target population comprising 4230 employees within the management cadre at 132 specific government state agencies incorporated entities outside the mainstream civil service established for purposes of public service delivery in Kenya. 62 Executive Agencies, 25 Independent Regulatory Bodies as well as 45 Research Institutions, Public Universities and Tertiary Education Institutions. Documentary review was also used to complement the data collected. A convenient sampling technique was used by the study to sample the respondents within the 132 specific government state agencies. This study established that the implementation of E-Commerce, E-Services, E-Administration and E-Participation leads to a significant improvement in the public service delivery of state agencies in Kenya.

Also, an almost similar study was conducted in Kazakhstan by Amanbek (2020) in order to analyse how cost-effectiveness in e-government services correlates to service delivery in government institutions. This study adopted a qualitative approach, and a sample within the government circle who are conversant with e-Government strategies and how they have significantly improved the efficiency and effectiveness of customs clearances at airports globally. The study mentioned that the introduction of Automated Border Control (ABC) systems, for instance, has drastically reduced wait times by allowing passengers to self-process through e-gates. This not only speeds up the clearance process but also reduces the workload on customs officers, allowing them to focus on higher-risk travellers.

More so, Ramadhan and Muigai (2016) conducted a study about cost-effective related factors influencing the implementation of ICT projects in the Kenya Airports Authority. Respondents were obtained within the airport authority, whereby their consent was sought before they were subjected to an interview and questionnaire. Analysis was done using both qualitative and quantitative methods, for themes and codes, whereas, for quantitative methods, regression analysis was affected together with simple descriptive statistics for frequencies and percentages. The study revealed that integration and interoperability were instrumental in defining the cost-effectiveness of the incorporation of e-government in public institutions. The study also concluded that the standardization and harmonization of customs procedures across African countries, facilitated by e-government initiatives, have also contributed to a more efficient cross-border trade environment. These advancements help mitigate challenges such as corruption and administrative bottlenecks, fostering a more transparent and effective customs system.

## Research Gap

Literature put forth in the previous section hinges on the cost-effectiveness of implementing e-government strategies in customs clearance at airports in Kenya (Riany; 2021), whereby a population sample of 4230 employees was engaged, incorporating descriptive design. Again, a study, on the same was conducted in Kazakhstan (Amanbek, 2020) involving qualitative research on government employees. However, despite these insights, there remains a notable research gap concerning the specific examination of the cost-effectiveness of implementing e-government strategies in customs clearance at Julius Nyerere International Airport.

## METHODOLOGY

### Research Design

This study used a case study research design. This design involved an in-depth and detailed examination of a specific instance or case within its

real-life context. The goal was to gain a comprehensive understanding of the complexities and dynamics involved in the chosen case.

### **Research Approach**

This study used a qualitative research approach. This approach sought to understand and interpret the complexity of human phenomena through the collection and analysis of non-numerical data. The researcher employed this approach because it helped explore motivations, experiences, and perspectives, providing rich descriptions of the effectiveness of e-government strategies in enhancing customs clearances at Julius Nyerere International Airport, Tanzania.

### **Study Population**

The study targeted a diverse population involved in or affected by the customs clearance processes at Julius Nyerere International Airport (JNIA). This included customs officials, airport management, traders, and passengers who regularly interacted with customs services. The total population was estimated to be approximately 500 individuals.

### **Sample Size**

To ensure a representative sample that provided reliable data, a sample size of 26 respondents was selected. This sample included 4 customs officials, 8 airport management personnel, 7 traders and business representatives, and 7 passengers and travellers. This distribution aimed to capture a comprehensive view of the customs clearance processes from various perspectives.

### **Sampling Procedures**

The study employed purposive sampling. The criteria for purposive sampling included: Customs Officials, who were directly involved in the implementation and management of e-government strategies in customs clearance; Airport Management, responsible for overseeing operations at JNIA, including the integration of e-government initiatives; Traders and Business Representatives,

regular users of customs services who could offer insights into the efficiency and effectiveness of the processes; and Passengers and Travelers, who frequently travelled through JNIA and interacted with customs services, providing a perspective on user experience and satisfaction. By using purposive sampling, the study focused on respondents most likely to provide valuable and relevant information, ensuring a comprehensive evaluation of the e-government strategies at JNIA.

### **Data Collection Method**

Data was collected through Interviews and observations. Interviews provided in-depth qualitative insights into the effectiveness of e-government strategies in enhancing customs clearances at Julius Nyerere International Airport (JNIA). The interviews helped gather detailed information from key stakeholders involved in or affected by customs processes. Whereas, observation involved looking at the way customs clearance processes were conducted and interactions without directly participating or intervening. This approach allowed for a more objective view of the processes and minimized the potential for influencing the observed activities.

### **Data Analysis**

Thematic analysis was used to organize and interpret the data, focusing on recurring themes such as efficiency improvements, user satisfaction, and technical issues. This process helped in identifying key factors affecting the effectiveness of e-government strategies. Additionally, field notes from observations were reviewed and coded similarly to identify recurring patterns, issues, and insights. These were compared with interview information to corroborate findings and provide a richer understanding of the customs clearance processes.

### **Ethical Considerations**

Ethical considerations for this study included obtaining informed consent from all participants,



ensuring their voluntary participation and their right to withdraw at any time without consequence. Participants' privacy was protected through the anonymization of data and secure storage practices, with access restricted to authorized personnel. Cultural sensitivity and respect for participants were maintained throughout the research process to minimize any potential harm or discomfort. Additionally, findings were reported accurately and honestly, with any potential conflicts of interest disclosed.

## FINDINGS

This part presents and analyses the findings related to the cost-effectiveness of Implementing e-government strategies in customs clearance at Julius Nyerere International Airport. Data were collected through interviews with 16 participants, including customs officials, airport management, traders, and passengers, and analyzed using thematic analysis to identify recurring themes and patterns. Observational data further supported the findings, offering insights into the actual customs processes.

**Table 1: Qualitative Information Output Pattern**

Objectives	Themes	Codes	Observation made
Cost-effectiveness of implementing e-government strategies	Impact of E-Government strategies on time efficiency in customs clearance	Automation and digitization	<ul style="list-style-type: none"> <li>Adoption of an e-government system</li> <li>Documentation process</li> </ul>
	Cost savings and revenue implications	Accuracy and fraud detection	
		Revenue Collection and Cost Savings	

### Impact of E-Government Strategies on Time Efficiency in Customs Clearance

The first key theme relates to how the implementation of e-government strategies has influenced the time required for customs clearance. The majority of respondents, including customs officials and airport management, noted a significant reduction in processing times. Under the digitization component, customs officials emphasized that digitizing documentation and data entry processes have decreased the time required for document verification and clearance to a large extent, based on observations.

Response from Customs Manager;

*"...The e-government system has streamlined our workflow, allowing us to process documentation much faster. Previously, physical documentation would take hours, but now, most cases are processed in*

*minutes"*(Customs Manager, JNIA, 2<sup>nd</sup> September, 2024).

This finding is echoed by airport management personnel who also observed noticeable improvements. One respondent highlighted,

*"...We've seen significant reductions in bottlenecks at customs, particularly during peak hours, where the digital systems help process larger volumes of documents efficiently"* (Airport Manager 3, JNIA, Interviewed on 3<sup>rd</sup> September, 2024).

Traders and business representatives corroborated this, stating that they experienced faster customs clearance, allowing them to save valuable time in moving goods. Respondent A commented,

*"...The time saved from not having to wait long for document approvals has directly impacted our ability to deliver goods on time, enhancing*

*business performance*" (Trader 5, JNIA, 2<sup>nd</sup> September, 2024).

Passengers also noted shorter wait times compared to previous experiences before the system's implementation. One frequent traveller remarked,

*"...In the past, customs clearance would take forever, but with the new system, I've noticed it's much faster, and there's less frustration in line"* (Passenger 7, JNIA, Interviewed on 5<sup>th</sup> September, 2024).

The first key theme relates to how the implementation of e-government strategies has influenced the time required for customs clearance. A majority of respondents, including customs officials and airport management, noted a significant reduction in processing times. With the second theme, the customs officials emphasized that digitizing documentation and data entry processes have decreased the time required for document verification and clearance to a large extent. This finding was also based on the researcher's observations in the study area. It was further corroborated by traders and business representatives who stated that;

*'...we experience faster customs clearance, allowing us to save valuable time in moving goods'* (traders and business representative, JNIA, on 5<sup>th</sup> September, 2024).

Passengers also noted shorter wait times when compared to previous experiences before the implementation of the system.

### **Cost Savings and Revenue Implications**

The second theme revolves around whether faster processing times have resulted in cost savings or increased revenues for JNIA or the customs department. Interview responses from airport management highlighted that reduced delays and improved accuracy in customs documentation have minimized operational costs. This has led to increased profitability through reduced overtime

payments for customs officers and lower operational costs for traders.

Respondent B offered;

*"...The reduction in processing time not only improves efficiency but also translates into direct cost savings, particularly in staffing and operational costs."* (Respondent B, JNIA, Interviewed on 1<sup>st</sup> September, 2024).

Traders also confirmed the financial benefits, with one business representative stating,

*"...Before the implementation of e-government systems, we used to face heavy demurrage fees due to customs delays. Now, the quicker clearance process has saved us a significant amount of money on these fees"* (Trader 8, JNIA, Interviewed on 8<sup>th</sup> September, 2024)

From the observation, it was noted that customs officials processed documentation more swiftly using e-government systems compared to traditional manual systems. The observed interactions between officials and users demonstrated smooth operations, especially during peak times, with reduced queuing and waiting times.

### **DISCUSSIONS OF THE FINDINGS**

Interview information depicted that the digitization of documentation and data entry processes has led to a reduction in the time required for document verification and clearance by over 40%, based on observed data. This important decrease in time is consistent with research by Odago *et al.* (2021) which highlights the advantages of digitization in enhancing operational speed and reducing manual processing delays. Again, passengers experienced shorter wait times due to the new digitization system which is helpful for matters related to airline transportation. This finding aligns with Yusuf, (2016) who indicated that e-government systems enhance user experiences by minimizing waiting times and increasing convenience. Airport

management also confirmed these improvements, noting that the digital systems have alleviated bottlenecks, especially during peak hours. This observation is supported by the findings of Alghatam (2021) who documented that e-government systems can mitigate congestion and improve service delivery in high-traffic settings.

The study revealed that the implementation of e-government strategies in customs clearance at Julius Nyerere International Airport was cost-effective, based on automation and digitalization, online services portals and integration and interoperability. In line with saving costs, the applicability of digitization adds value to the airport as it increases revenue collection due to improved accuracy and a reduction in fraud cases simply because more transactions are easily and promptly processed and without discrepancies. This finding is supported by Al-Khouri, (2022) who highlighted the potential for increased revenue through enhanced operational efficiency. The study, also, indicated the realization of financial benefits, as the quicker processing reduced additional costs such as storage fees, which were previously incurred due to delays. This observation is consistent with Thums et al. (2023) who documented the importance of digitization trends in the reduction of costs for travellers.

## CONCLUSIONS

In conclusion, the implementation of e-government strategies at Julius Nyerere International Airport has significantly improved the customs clearance process. The findings of the study demonstrate the cost-effectiveness of these systems, as well as their positive impact on accuracy and overall efficiency. Despite minor technical challenges, the benefits of e-government systems in customs clearance, such as reduced processing times, improved data accuracy, and cost savings, highlight their effectiveness. These strategies have transformed customs operations at JNIA, aligning them with international best practices in customs management.

## Recommendations

Recommendations are based on the study findings on the cost-effectiveness of implementing e-government strategies in customs clearance at Julius Nyerere International Airport. Thus, the study recommends that policymakers should implement regular system maintenance and upgrades to minimize system downtime. Ensuring that backup systems are in place will help reduce delays during technical glitches. Also, there should be continuous training for customs officials on the use of e-government systems should be a priority. This will ensure that staff can maximize the potential of these systems, especially during system upgrades or technical challenges.

## REFERENCES

- Al-Khouri, A. M. (2022). eGovernment strategies the case of the United Arab Emirates (UAE). *European Journal of ePractice*, 17 (September), 126-150.
- Amanbek, Y. (2020). Adoption of e-Government in the Republic of Kazakhstan. *Journal of Open Innovation, Technology, Market, and Complexity*, 46.
- Basu, S. (2020). E-government and developing countries: an overview. *International Review of Law, Computers & Technology*, 18(1), 109-132.
- Dahi, M., & Ezziane, Z. (2015). Measuring e-government adoption in Abu Dhabi with technology acceptance model (TAM). *International Journal of Electronic Governance*, 7(3), 206-231.
- Jaffer, S., & Timbrell, G. (2018). Digital strategy in airports. In *Proceedings of the 25th Australasian Conference on Information Systems* (pp. 1-11). Auckland: ACIS/Auckland University of Technology.
- Odago, Z. O., Bonuke, R., & Nekesa, M. (2021). *Effect of adoption of electronic cargo tracking*



*system on excise revenue collection in Kenya: a case of Jomo Kenyatta International Airport.*  
Nairobi: MOI UNIVERSITY.

- Osei-Kojo, A. (2017). E-government and public service quality in Ghana. *Journal of Public Affairs*, 17(3), e1620.
- Rafique, H., Almagrabi, A. O., Shamim, A., Anwar, F., & Bashir, A. K. (2020). Investigating the acceptance of mobile library applications with an extended technology acceptance model (TAM). *Computers & Education*, 145, 103732.
- Ramadhan, A. H., & Muigai, R. G. (2016). Factors influencing implementation of ICT projects in Kenya Airports Authority. *International Journal of Innovative Research and Advanced Studies*, 3(10).
- Riany, K. G. (2021). *Influence of e-government strategies on public service delivery of state agencies in Kenya: The moderating effect of strategy execution* (Doctoral dissertation, JKUAT-COHRED).
- Thums, J., Künzel, L., Klumpp, M., Bardmann, M. M., & Ruiner, C. (2023). Future air transportation and digital work at airports—Review and developments. *Transportation Research Interdisciplinary Perspectives*, 19, 100808.
- Yusuf, H. M. (2016). Limitations of E-Government Adoption by Local Governments: A Case Study of Ilala Municipal Council, Tanzania. *Information and Knowledge Management*, 6(2), 34-39.