
**IMPACTS OF ELECTRONIC PAYMENT SYSTEMS ON THE
CONSTRUCTION INDUSTRY IN TANZANIA: THE CASE
STUDY OF ARUSHA DISTRICT COUNCIL**

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ABSTRACT

Purpose of the Study: This study examined the impacts of electronic payment systems (EPS) on the construction industry in Tanzania, using Arusha District Council (ADC) as a case study. with operational and socio-economic outcomes among construction stakeholders.

Statement of the Problem: Despite the increasing adoption of EPS in public sector operations, limited empirical evidence exists regarding their operational and socio-economic implications within the construction industry, particularly in local government projects in emerging economies.

Methodology: The study adopted a quantitative cross-sectional research design. Data were collected from 85 respondents, including contractors, financial institution representatives, and government officials, using structured questionnaires. Ordinal logistic regression analysis was employed to examine relationships between EPS features and perceived performance outcomes.

Findings: The findings indicate that transaction security, ease of use, traceability, and appropriate levels of anonymity were positively associated with operational efficiency, transparency, and user satisfaction. However, moderate security controls and higher user engagement requirements were negatively associated with user experience.

Conclusion: The study concludes that EPS have significant potential to enhance efficiency, transparency, accountability, and trust within the construction sector when supported by secure, user-friendly, and well-coordinated implementation frameworks.

Recommendation: The study recommends strengthening user-oriented system design, improving digital payment training and awareness, and streamlining administrative procedures to maximise the operational and socio-economic benefits of EPS within the construction industry.

Keywords: *Electronic Payment Systems (EPS), Construction Industry, Operational Efficiency, Transaction Transparency, Digital Payment Governance*

INTRODUCTION

The construction industry is a fundamental pillar of economic development, particularly in developing countries such as Tanzania, where infrastructure development remains central to national growth strategies. The sector contributes significantly to employment creation and supports the delivery of essential public services such as transportation, housing, education, water supply, and healthcare infrastructure. According to the Tanzania National Bureau of Statistics (2022), the construction sector contributed approximately 4.8% to Tanzania's Gross Domestic Product (GDP) in 2022, demonstrating its strategic role in socio-economic transformation. Despite this contribution, the industry continues to face operational and financial management challenges that affect efficiency, accountability, transparency, and project sustainability (Aron et al., 2025).

One of the persistent challenges affecting construction projects, particularly within local government authorities, is the continued reliance on traditional and manual payment methods among contractors, suppliers, consultants, and other project stakeholders. These payment approaches, which largely depend on cash transactions and paper-based systems, are frequently associated with delays, poor record management, lack of transaction traceability, and increased administrative costs (Adaku et al., 2024). In construction projects, delayed payments have been identified as a major factor contributing to project cost overruns, schedule delays, contractual disputes, and reduced contractor performance (Malomane & Musonda, 2025). Such effects are more severe among small and medium-sized enterprises (SMEs), which often possess limited financial capacity to withstand prolonged payment cycles and delayed reimbursements (URT, 2023).

Globally, electronic payment systems (EPS) have emerged as important instruments for improving financial efficiency, accountability, and operational performance across public and private sectors. EPS include technologies such as mobile money platforms, electronic funds transfers, internet banking, digital wallets, and integrated e-government payment gateways. In many emerging economies, EPS adoption has been associated with improved transaction speed, transparency, reduced corruption risks, and better financial monitoring mechanisms (Chen et al., 2021). Recent studies further indicate that digital payment technologies can significantly improve governance and operational coordination within infrastructure and construction projects by facilitating timely payments, financial traceability, and automated transaction management (Demagistris et al., 2022).

In Tanzania, the government has undertaken substantial reforms aimed at digitizing public financial management systems through the implementation of the Government Electronic Payment Gateway (GePG). The GePG system was introduced to centralize government revenue collection and improve transparency, accountability, and efficiency in financial transactions across public institutions. Empirical evidence suggests that GePG has significantly enhanced public revenue collection and reduced operational costs associated with manual payment systems. For instance, Mtebe and Sausi (2021) found that the implementation of GePG increased revenue collection by 44.28% while reducing collection-related costs by 27.10% across surveyed public institutions in Tanzania. Similarly, Kessy (2019) reported that electronic payment systems improved tax compliance, revenue monitoring, and financial reporting within local government authorities, although challenges such as poor connectivity and limited technical support remained significant barriers.

Recent empirical studies have also demonstrated that user satisfaction and continued adoption of GePG are strongly influenced by perceived usefulness, system quality, facilitating conditions, and institutional support (Sausi et al., 2021; Khamis & Hwang, 2025). These studies show that digital payment systems can strengthen transparency, accountability, and trust in public financial management processes. Furthermore, Swedi and Lubua (2024), in a study conducted at the Tanzania Ports Authority, established that e-payment systems positively influenced procurement performance by reducing payment delays, improving record accuracy, and minimizing fraud risks. Likewise, Mayunga and Jilenga (2024) found that GePG implementation improved revenue predictability and financial management efficiency within higher learning institutions in Tanzania.

Despite the growing body of literature on digital finance and e-government payment systems, empirical studies focusing specifically on the construction sector remain limited, particularly within local government infrastructure projects in developing countries. Most existing studies have concentrated on revenue collection, taxation systems, banking services, procurement performance, or public sector financial management, with limited attention given to how EPS affects construction project implementation, contractor performance, operational efficiency, and stakeholder satisfaction. Yet, the construction industry possesses unique operational characteristics, including complex payment chains, multiple project actors, contract-based

financial arrangements, and high risks of delayed disbursement, all of which require efficient and transparent payment mechanisms.

In many developing countries, including Tanzania, construction projects at district and municipal levels continue to experience payment inefficiencies, inadequate financial tracking systems, and administrative bottlenecks that undermine timely project completion and increase opportunities for financial mismanagement (URT, 2023). Although the Government of Tanzania has strengthened digital payment infrastructure through policies promoting interoperability, affordability, and digital financial inclusion (BOT, 2025), evidence regarding the practical impacts of EPS adoption on construction project performance remains inadequate. This indicates a significant contextual and sectoral research gap.

Therefore, this study seeks to assess the impact of electronic payment systems on the construction industry in Arusha District Council. Specifically, the study examines the socio-economic and operational implications of EPS adoption among construction stakeholders, including contractors, suppliers, consultants, and local government authorities. By addressing the existing empirical gap, the study contributes to the growing discourse on digital transformation in infrastructure management and provides evidence that may support policy development, improve financial governance, and enhance efficiency, transparency, and accountability within Tanzania's construction sector.

LITERATURE REVIEW

One of the two theories adopted to guide this study, Transaction Cost Economics (TCE), developed by Oliver E. Williamson in 1975, initially focused on minimising the costs associated with conducting economic transactions, such as information gathering, negotiation, enforcement, and compliance (Williamson, 1975). In the context of electronic payment systems (EPS) in the construction sector, TCE helps explain how digital tools can reduce transaction costs by streamlining payment processes, enhancing transparency, and minimising risks like payment fraud and cash mishandling. For example, studies by Zaefarian et al. (2017) highlight that digital platforms can increase operational efficiency and improve inter-organisational trust by lowering coordination costs. However, the theory also helps identify potential challenges such as system implementation costs, cybersecurity risks, and training requirements. TCE thus supports an economic rationale for analysing the ongoing use of EPS, focusing on their cost-efficiency and governance implications in construction sector operations.

Furthermore, the stakeholder theory was adopted in this study, introduced by R. Edward Freeman in 1984. The theory argues that organisational success depends on managing the interests and relationships of all parties affected by its operations - not just shareholders (Freeman, 1984). In the construction industry, stakeholders such as clients, contractors, suppliers, financial institutions, and regulators each interact differently with electronic payment systems. This theory is highly applicable for understanding the socioeconomic benefits and challenges arising from EPS usage, as it encourages inclusive analysis of stakeholder experiences. For instance, EPS can enhance transparency and accountability (Mitchell et al., 1997), but may also introduce inequalities if some actors lack access to digital infrastructure or technical knowledge. Stakeholder Theory, therefore, provides a valuable framework to explore how EPS influence the dynamics of collaboration, equity, and value creation across the construction sector.

In the context of this study, EPS features such as speed, ease of use, security, anonymity, traceability, and user engagement are conceptualised as operational mechanisms through which digital payment systems influence construction sector outcomes. Transaction Cost Economics explains that improved speed, traceability, and ease of use reduce coordination, monitoring, and transaction costs, thereby enhancing operational efficiency. Similarly, Stakeholder Theory suggests that security, transparency, anonymity, and user engagement shape stakeholder trust, accountability, and satisfaction, which ultimately influence broader socio-economic outcomes. However, these relationships may not always be linear, as excessive security protocols, complex verification procedures, or unclear privacy controls may increase user burden and reduce satisfaction despite improving accountability and control.

Various empirical studies have been conducted in different countries on the socioeconomic and operational impacts of EPS on the construction sector. For instance, Ramli (2020) conducted a study in Indonesia whose purpose was to analyse the influence of features and benefits of a digital payment application on customers' intention to use. The study adopted a descriptive and verification research design, using a quantitative approach. The population comprised of customers of the Go-Pay digital payment application in Jakarta and data were collected through questionnaires distributed to purposively selected respondents. Partial Least Squares (PLS) was used for data analysis. The study's findings revealed that the features and benefits of the Go-Pay application had a positive and significant effect on customer's intention to use digital payment systems.

While the study focused on consumer behaviour, it indirectly highlighted that user-friendly features and perceived benefits of digital payment platforms facilitate widespread adoption and use, which can enhance operational efficiency and economic convenience for sectors like the construction industry by promoting timely and secure transactions. The findings imply that EPS, when perceived as beneficial and easy to use, can contribute to enhanced operational efficiency and cost-effectiveness in industries such as construction, especially in streamlining payments and reducing transaction delays. These implications are relevant to the current study, as they provide foundational insight into how digital payment platforms can transform transactional operations and improve productivity in the construction industry.

However, the study was limited in that it focused solely on consumer perspectives in an urban context and on a specific application (Go-Pay), without directly addressing the operational or socio-economic impacts of digital payments at a wider scope. The current study has addressed these gaps by adopting a quantitative approach, specifically targeting stakeholders in the construction industry within the Arusha District Council. Primary data were collected using structured questionnaires to capture both the socio-economic and operational impacts of electronic payment systems from industry professionals. This approach ensures that the findings are context-specific, grounded in the experiences of the Tanzanian construction sector, and therefore more relevant for policy and practice within that setting.

In Nigeria, Shehu and Bardi (2024) conducted a study that assessed the impact of EPS on service delivery at Warri Refining Petroleum Company (WRPC). The study adopted a survey research design, where data were collected from 250 participants using structured questionnaires, and the data were analysed using SPSS. The study's findings revealed that the use of EPS significantly improved operational efficiency by reducing transaction turnaround times and minimising the risks of handling physical cash. Additionally, it enhanced socio-economic outcomes such as customer satisfaction, convenience, and overall cost savings. These findings imply that EPS can lead to substantial operational improvements and economic benefits, which are crucial for sectors like the construction industry that rely heavily on financial transactions.

The relevance of these findings to the current study lies in their demonstration of how digital payment platforms can streamline processes and improve service efficiency, which aligns with the aim of understanding the socio-economic and operational impacts of such systems in Tanzania's construction sector. However, the study was conducted in the oil and gas industry,

which may have different operational dynamics and financial infrastructures compared to the construction industry. These gaps may limit the generalisability of the findings to the construction industry in Tanzania. The current study addresses these gaps by focusing directly on the construction industry in Arusha District Council, Tanzania, and using a quantitative approach to gather primary data from industry stakeholders through questionnaires.

Also, Kessy (2019) conducted a study in Tanzania aiming to examine the role of electronic payment systems in revenue collection within Kinondoni Municipal, Dar es Salaam. The study employed a quantitative approach using semi-structured questionnaires distributed to revenue collectors and administrators, selected through a simple random sampling procedure, with a total sample of 77 respondents. Data were analysed using descriptive statistics and linear regression. The study's findings revealed that EPS positively impacted operational efficiency by improving the monitoring of revenue sources and enhancing the quality of financial reporting. From a socio-economic perspective, the system contributed to increased tax compliance, which implies a broader capacity for public resource mobilisation and financial accountability.

These results highlight that e-payment systems can enhance both administrative efficiency and economic governance - critical factors for a well-functioning construction industry that depends on streamlined financial systems and public infrastructure investment. The implications of these findings suggest that implementing EPS can strengthen financial transparency, compliance, and revenue assurance, which in turn can support efficient project funding and payment processing within the construction industry. These benefits are relevant to the current study, as they illustrate the broader operational and economic impacts of digital transactions in the Tanzanian context. However, the study's scope was on the public revenue collection sector and did not directly address how e-payment systems affect private-sector industries such as construction. The current study addresses these limitations by focusing on the construction industry in Arusha District Council, using a quantitative approach and collecting primary data through structured questionnaires from a broader base of construction stakeholders.

In Tanzania, Mtebe and Sausi (2021) conducted a study which aimed to evaluate the performance of the Government Electronic Payment Gateway (GePG) system implemented by the Ministry of Finance and Planning to enhance government revenue collection. The study adopted a concurrent mixed-methods research design, integrating questionnaires within

interviews, and involved 442 respondents from 271 public institutions across 11 regions. Data were analysed using both quantitative and qualitative techniques, with performance measured based on public value dimensions: efficiency, effectiveness, and social value. The study's findings revealed that the GePG system significantly increased operational efficiency, as evidenced by a 44.28% rise in revenue collection and a 27.10% reduction in collection costs between 2015/2016 and 2019/2020.

From a socio-economic perspective, the system fostered greater public trust, transparency, and traceability in financial transactions, demonstrating the broader societal value of digital payment infrastructure. The implications of these findings suggest that comprehensive digital payment systems such as GePG can significantly improve financial governance and resource efficiency, outcomes that are highly relevant to the construction industry, which relies on timely payments, transparent transactions, and cost-effective project execution. The findings support the current study's aim of assessing how similar systems impact the socio-economic and operational aspects of the construction sector in Tanzania. However, the lack of sectorial focus impairs the scope due to the specificity of the findings. The current study addresses this gap by concentrating on the construction industry within Arusha District Council, using a quantitative approach to collect primary data via structured questionnaires from construction professionals.

In Tanzania, Arthur et al. (2023) conducted a study which aimed to assess the influence of the electronic payment system on the performance of public procurement in Kasulu District. The study adopted a positivist philosophy and implemented a cross-sectional research design. Data were collected from 395 respondents, including employees of Kasulu District Council and suppliers, using questionnaires selected through simple random sampling. Data were analysed using SPSS Version 27, with bivariate regression and descriptive analysis. It was revealed that the e-payment system had a significant and positive impact on operational performance, particularly in public procurement processes.

Key improvements included timely resource allocation, increased value for money, better service quality, fewer user complaints, and enhanced communication. These operational enhancements imply socio-economic benefits, such as improved stakeholder satisfaction and more efficient public service delivery. These findings imply that e-payment systems can be powerful tools for improving efficiency, transparency, and value optimisation in procurement – an area closely linked to the construction industry, which depends heavily on procurement

for materials, services, and labour. However, while the study provides strong evidence of benefits, its scope was tied to public procurement, and in this instance, considering the construction industry would be worthwhile.

Swedi and Lubua (2024) conducted a study in Tanzania to investigate the influence of electronic payment practices on procurement performance within the Tanzania Ports Authority (TPA). The study adopted a quantitative approach and used a case study design, with data collected from a sample of 133 individuals, of which 98 respondents returned completed questionnaires and document reviews. Data were analysed using descriptive statistics and regression analysis. The study's findings revealed a strong positive relationship between electronic payment practices and procurement performance. Specifically, e-invoicing helped reduce payment delays, while e-receipts improved record accuracy and reduced fraud risks. These outcomes reflect improvements in operational efficiency and transparency, which in turn contribute to socio-economic benefits such as increased trust, reduced financial leakage, and enhanced cost control in procurement activities.

The findings imply that the implementation of EPS can significantly streamline procurement processes, ensure faster payments, and reduce operational bottlenecks, which are all vital for the construction industry that depends on efficient procurement cycles and financial flows. The results are relevant to the current study as they reinforce the argument that digital payment systems can have transformative effects on both operational workflows and economic accountability in sector-specific applications. However, the study was confined to tools like e-invoicing and e-receipts but did not provide an in-depth assessment of challenges or user experiences, weakening its ability to guide broader policy or practice. The current study addresses this gap by focusing on wider user satisfaction and its implications for policymakers. The analysis of the impacts of e-payment systems use in the construction industry was typically derived from the existing literature reviewed and the author's conceptualisation. The conceptual framework of this study is summarized in Figure 1 below.

The conceptual framework assumes that specific EPS characteristics influence both operational and socio-economic outcomes within the construction sector. Positive outcomes may include improved transaction efficiency, transparency, accountability, cost reduction, stakeholder trust, and timely project execution. However, some EPS features may also generate unintended negative effects such as procedural complexity, user frustration, approval delays, and dependency on digital infrastructure. Therefore, the study assumes that the effects of EPS

adoption may vary depending on users' experiences, institutional practices, and system implementation conditions.

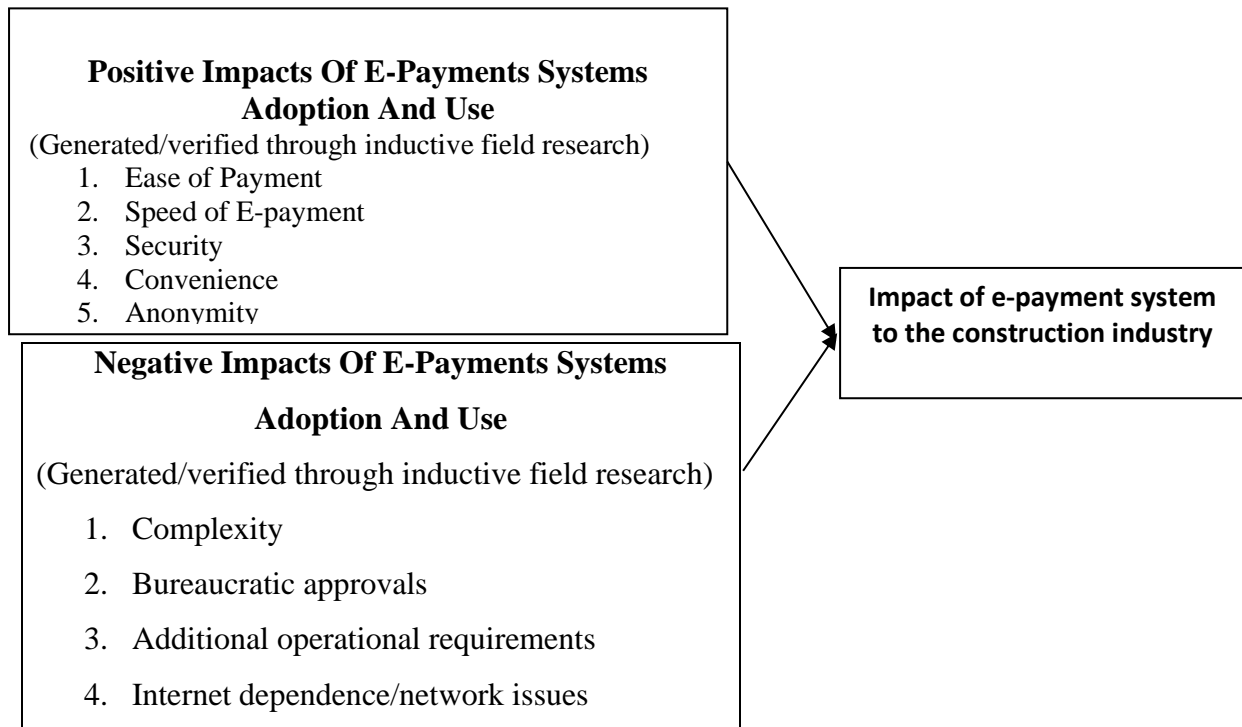


Figure 1: Conceptual framework

(Source: Authors, 2023; Literature synthesis)

METHODS

This study adopted a quantitative approach and applied a cross-sectional research design, where quantitative data were collected at one point in time to make inferences about the population, and analysed using ordinal logistic regression. A case study was conducted at Arusha District Council (ADC) and related partners such as contractors, banks, and the Sub-Treasury, all based in Arusha in February to March 2025. The study area was selected due to ADC's representative nature in construction sector e-payment procedures under GePG platform for all local authorities. The population included staff from ADC (45), contractors (23), commercial banks (12), and the Ministry of Finance and Planning (10), totalling to 90 respondents who were handed over questionnaires. A total of 85 respondents returned questionnaires completed, making a response rate of 94.4%, warranting to proceed with data analysis.

A stratified sampling approach was used to accommodate different respondent groups, primarily employing non-probability techniques such as purposive and judgmental sampling, given the financial sensitivity of the topic. A sample size of 10% from each group was determined based on prior research as suggested by Kim (2022) that a good sample should be

between 10% to 30% of the target population. Data were collected using self-administered questionnaires, with prior permissions and ethical assurances in place. Reliability was enhanced through Cronbach alpha test in which questionnaire items scored above 0.8, indicating reliable items. Ethical considerations included ensuring respondent confidentiality, anonymity, and informed consent regarding the study's purpose and use of findings. Although the study relied on self-reported questionnaire data, several measures were adopted to minimise common method bias, including assurance of respondent anonymity, use of structured and neutral question wording, and separation of dependent and independent variable items within the questionnaire design. Nevertheless, the possibility of common method bias and omitted variable effects cannot be completely ruled out and therefore represents a limitation of the study.

FINDINGS AND DISCUSSION

Analysis of the impacts of an e-payment system is conducted based on the six key positive and negative impacts of an e-payment system stated in the conceptual framework. These are speed of e-payment, ease of e-payment, security, convenience, anonymity and traceability of transactions. Each of these features is further exploded into measured items from which respondents were requested to express their opinions based on a 5-point Likert scale item. The research objective elicits a cause-and-effect relationship between independent variables and dependent variables. For the purpose of explaining or assessing the impacts of the e-payment system on the construction industry, two questions 31 and 32 were designated as dependent variables representing the satisfaction levels attained or perceived by respondents to have been attained as a result of the adoption of EPS.

For the purpose of analysis, possible responses of "Strongly agree", "Agree", "Disagree", Not Sure and "Strongly disagree" as nominal scale were assigned value labels of 5, 4, 3, 2 and 1. The ordinal logistic regression model was built in order to regress responses of questions 31 and 32 (dependent or response variable) against multiple responses on the independent (predictor) variables recorded in questions 4 to 30. The choice of ordinal logistic regression model was driven by its predictive power for non-linear data. Being a special non-linear regression model available in statistics, it suits in analysing categorical independent (predictor) variables to a nonparametric dependent variable(s). Table 1 presents a sample structure of the dataset used in the ordinal logistic regression model, illustrating how each respondent's

responses to the dependent variables (Qn31 and Qn32) and independent variables (Qn4–Qn30) were organized for analysis.

Prior to conducting ordinal logistic regression analysis, diagnostic tests were performed to confirm model suitability. Multicollinearity was assessed using Variance Inflation Factor (VIF), where all predictor variables recorded values below the recommended threshold of 5, indicating absence of serious multicollinearity. In addition, the proportional odds assumption was assessed and found acceptable for the fitted models, supporting the appropriateness of ordinal logistic regression for the analysis.

Table 1: Ordinal logistic regression model dataset

Respondent No.	Dependent variables		Independent variables		
	Qn31 (receiving payment through EPS)	Qn32 (Overall satisfaction with EPS)	Qn4	Qn30
1	5	3	2	...	1
2	3	3	3	...	4
3	4	2	2	...	2
...
85	4	2	1	3	5

(Source: Field data, 2025)

Before the dataset was analysed, the multicollinearity test was done to ensure they were robust and could give a strong predictive power. Table 2 below shows that all VIF scores are below 5, indicating that there is no multicollinearity amongst the independent variables.

Table 2: Test for multicollinearity using Variable Inflation Factor (VIF)

Variable	VIF	Variable	VIF	Variable	VIF
const	80.581	Ease3	2.837	Anonym1	3.185
Speed1	3.325	Ease4	2.424	Anonym2	2.571
Speed2	3.132	Security1	2.379	Anonym3	2.534
Speed3	2.050	Security2	2.315	Anonym4	2.529
Speed4	3.553	Security3	2.952	Traceab2	3.033
Ease1	3.571	Security4	2.956	Traceab4	3.228
Ease2	2.177	Conven3	2.452	Engag1	3.681

Variable	VIF	Variable	VIF	Variable	VIF
		Conven4	2.701	Engag2	2.874
				Engag3	2.627

(Source: Field data, 2025)

The ordered logistic regression results for EPS satisfaction reveal several key drivers which impact transaction aspects which ultimately lead to satisfaction with the use of EPS by the construction stakeholders. Firstly, the security of the transactions plays the most significant role - higher ratings of security (especially Security2 to Security4) and there is a strong association with the dependent variable. Anonymity demonstrates mixed effects across users. While some respondents perceived privacy protection as enhancing trust and transaction confidence, others may have associated higher anonymity with reduced transaction transparency, increased verification procedures, or uncertainty regarding accountability. This suggests that anonymity within EPS may simultaneously improve user confidence while also creating concerns regarding transaction monitoring and institutional control. Additionally, traceability at its one level (Traceab4) significantly impacts payment operations and satisfaction, likely due to improved transparency and trust. Higher levels of user engagement were negatively associated with satisfaction, suggesting that excessive procedural involvement, repeated verification requirements, or increased interaction demands may create operational inconvenience and user fatigue. Although such controls may strengthen accountability and compliance, they may also increase transaction complexity and reduce perceived convenience among construction stakeholders.

Table 3: Impacts of the EPS on handling transactions in the construction sector

Predictor	Coefficient	p-value	Effect Direction
Security2	1.439	0.003	Positive
Security3	1.791	0.003	Positive
Security4	2.597	0.000	Positive
Anonym1	1.582	0.005	Positive
Anonym2	-2.738	0.001	Negative
Traceab4	3.157	0.000	Positive
Engag2	-1.249	0.018	Negative
Engag3	-2.354	0.000	Negative

(Source: Field data, 2025)

The data in Table 3 shows results which corroborate with what was observed by Ramli (2020) who noted that EPS features and benefits have positive and significant effects towards the sector of interest. Security of transactions and traceability of knowing who has paid for which invoice or certificate in e-payment systems. Also, these findings slightly confirm what was found by Shehu and Bardi (2024) in Nigeria EPS significantly improved operational efficiency by reducing transaction turnaround times and minimising the risks of handling physical cash (security issue). In a slightly different setting, Kessy (2019) revealed that EPS positively impacted operational efficiency by improving the monitoring and quality of financial reporting. From a socio-economic perspective, the system contributed to increased tax compliance.

For the overall positive impacts on the construction through payment execution (Satisf2), the results similarly highlight security and ease of use as important predictors. The negative effect observed in Security2 may indicate that intermediate security controls are perceived as insufficient for ensuring full protection while simultaneously increasing transaction procedures. This finding suggests that users may prefer either highly secure systems with clear protection mechanisms or simpler systems with minimal procedural interruptions.

Speed2 and Anonym3 also show positive and significant effects, suggesting that moderate speed and perceived privacy are associated with improved satisfaction. Overall, the findings suggest that to enhance user satisfaction, payment systems should focus on maximising perceived security, ensuring high ease of use, maintaining optimal transaction speed, and communicating privacy protections. Table 4 below presents key statistics found.

Table 4: The overall positive impacts of the EPS in the construction sector

Predictor	Coefficient	p-value	Effect Direction
Speed2	1.231	0.047	Positive
Ease4	1.179	0.003	Positive
Security2	-0.877	0.028	Negative
Anonym3	1.174	0.004	Positive

(Source: Field data, 2025)

Data in Table 4 are also supported by Shehu and Bardi (2024) who found that EPS significantly improved operational efficiency by reducing transaction turnaround times (speed) in a bureaucratic public settings. Other findings that are in line with these findings are those by Mtebe and Sausi (2021) who revealed that the EPS significantly fostered greater public trust, transparency, and traceability in financial transactions, demonstrating the broader societal

value of digital payment infrastructure. Furthermore, a study by Arthur et al. (2023) had similar observations that EPS had a significant and positive impacts on operational performance particularly in public procurement and contractor engagement processes. Delays in construction projects due to late payments approval outside the EPS was beyond the scope of this study as they more administrative than directly involved in EPS. Likewise, a study by Swedi and Lubua (2024) supported these findings by revealing that there is a strong and positive relationship between e-payment practices and procurement performance, including works procurement.

CONCLUSION

This study demonstrates that the impacts of electronic payment systems (EPS) in the construction sector are not uniformly positive, but are instead shaped by the configuration and perception of specific system features. While higher levels of security strongly enhance user confidence and operational efficiency, the observed negative effect of moderate security levels suggests a threshold effect, where partially implemented or poorly communicated security measures may create uncertainty rather than trust. A similar pattern is evident in anonymity: whereas clearly defined anonymity enhances user satisfaction, inconsistent or ambiguous levels undermine confidence, reflecting misalignment between system design and user expectations.

The negative association between higher user engagement and satisfaction further challenges conventional assumptions, indicating that increased interaction may impose cognitive or procedural burdens, particularly in contexts characterised by limited digital literacy or unstable internet connectivity. These findings collectively suggest that EPS effectiveness is less about the presence of features and more about their coherence, clarity, and usability within specific institutional and infrastructural contexts.

However, these conclusions should be interpreted with caution. The study is based on a relatively small, localised sample drawn from Arusha District Council and relies on non-probability sampling techniques, which may limit the generalisability of the findings. Additionally, the cross-sectional design restricts the ability to capture changes in user behaviour over time. Therefore, while the study provides valuable context-specific insights, its conclusions are analytically indicative rather than broadly generalisable across the entire construction sector in Tanzania.

RECOMMENDATIONS

In light of the findings and associated limitations, the following context-sensitive recommendations are proposed:

First, policymakers and system developers should prioritise clarity and consistency in EPS design, particularly in relation to security and anonymity features. Rather than simply increasing security layers, efforts should focus on ensuring that such features are transparent, well-communicated, and aligned with user understanding, thereby avoiding the uncertainty associated with intermediate or ambiguous configurations.

Second, system design should minimise unnecessary user interaction by promoting simplified workflows and intuitive interfaces, especially in environments with varying levels of digital literacy and infrastructural constraints. This includes reducing procedural complexity and optimising system responsiveness under low-connectivity conditions

Third, targeted capacity-building initiatives, including user training and technical support, should be implemented to address skill gaps that may contribute to dissatisfaction with EPS usage. Such interventions should be tailored to specific stakeholder groups within the construction sector.

Finally, given the study's limited scope, further research is recommended using larger, more diverse samples and probability-based sampling techniques across multiple regions. Longitudinal studies would also be valuable in examining how user perceptions and system impacts evolve over time. These efforts would strengthen the empirical basis for broader policy formulation and enhance the scalability of EPS interventions within Tanzania's construction industry.

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