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The Role of Governance Features in Automated Procurement Systems in Reducing Procurement Irregularities: A Case Study of the Kenya Electricity Transmission Company (KETRACO)

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Abstract: Purpose: This study investigates the development of an evidence-based Automated Procurement framework aimed at mitigating procurement irregularities at the Kenya Electricity Transmission Company (KETRACO). It specifically examines the influence of governance features—transparency, accountability, automation, and institutional governance—on procurement integrity.

Design/Methodology/Approach: Employing a mixed-methods research design, the study integrated quantitative and qualitative approaches. A census survey collected quantitative data from employees involved in procurement, while purposive sampling identified key informants for qualitative interviews. Quantitative data were analyzed using descriptive statistics, reliability analysis, correlation, regression, and moderation tests. Qualitative data underwent thematic analysis to capture contextual insights.

Findings: Descriptive findings indicated high levels of transparency (mean = 4.05), accountability (mean = 3.85), automation (mean = 3.95), and institutional governance (mean = 3.75), while procurement irregularities were generally low. Correlation results demonstrated significant negative relationships between all governance features and procurement irregularities, with transparency ($r = -0.52$) and automation ($r = -0.50$) showing the strongest associations. Regression analysis confirmed that governance features collectively explained 52% of the variance in procurement irregularities ($R^2 = 0.52$). Moderation analysis revealed that institutional governance strengthens the impact of transparency, accountability, and automation on reducing irregularities. Qualitative findings supported these results, highlighting organizational, policy, and operational factors shaping the system's functionality.

Originality/Value: This study provides empirical evidence on the catalytic role of institutional governance within technology-driven procurement systems. It concludes that an integrated governance approach is essential for reducing procurement irregularities and offers a validated framework for enhancing Automated Procurement effectiveness in public sector entities.

Keywords: Automated Procurement (e-GP), Procurement Irregularities, Transparency, Accountability, Automation, Institutional Governance, Mixed-Methods, KETRACO.

I.   Introduction

Public procurement represents a substantial portion of government expenditure worldwide, making it a critical lever for economic development and a significant vulnerability to corruption and inefficiency (Kohler & Dimancesco, 2020). In response, governments have increasingly turned to Automated Government Procurement (Automated Procurement) systems, designed to enhance efficiency, transparency, and value for money (Tabrizi, 2025). Kenya, through its Integrated Financial Management Information System (IFMIS), is among the nations that have adopted this digital transformation. However, the implementation of Automated Procurement systems has not been a panacea. As noted by Akida (2024), technical hitches and implementation gaps often persist, preventing the realization of full benefits. This is starkly

illustrated at the Kenya Electricity Transmission Company (KETRACO), a strategic state corporation, which, despite having an Automated Procurement platform, experienced significant procurement scandals, such as the movement of high-value transformers without contractual documentation. This paradox—the coexistence of a digital system and persistent irregularities—forms the core problem this study addresses.

The fundamental issue is that Automated Procurement systems are often implemented as superficial technical solutions without being anchored in robust governance foundations (Mamun, 2018). The existing literature reveals a significant gap: a lack of specific empirical investigation into how the designed *governance features* within these systems— transparency, accountability, and automation—directly influence the reduction of procurement irregularities, particularly within the moderating context of institutional governance.

Therefore, this study sought to analyze the effectiveness of these governance features in KETRACO's Automated Procurement system. The specific objectives were to:

i.   Assess the influence of transparency mechanisms on the reduction of procurement irregularities.
ii. Examine the impact of accountability features on the reduction of procurement irregularities.
iii. Evaluate the role of process automation in minimizing opportunities for procurement irregularities.
iv. Analyze the moderating effect of institutional governance strength on these relationships.

II.   Literature Review

2.1 Theoretical Framework

This research is anchored in two primary theories. **Agency Theory** (Jensen & Meckling, 1976) explains the principal-agent problem in procurement, where officials (agents) may act in their own interest rather than that of the public (principal). Transparency mechanisms in Automated Procurement are theorized to mitigate this by reducing information asymmetry (Shevchenko et al., 2020). The **Technology Acceptance Model (TAM)** (Davis, 1989) provides the lens to understand how the perceived usefulness and ease of use of an Automated Procurement system influence its adoption and effective utilization, thereby determining its success in enforcing compliance (Yaldaie, 2025).

2.2 Empirical Review and Conceptual Framework

Prior research affirms that digital systems can enhance fiscal transparency and combat corruption (Mahuri, 2024). Automation reduces human intervention and error, creating reliable audit trails (Friday et al., 2024). However, a critical challenge is the circumvention of these systems by users, highlighting that technology alone is insufficient.

The conceptual framework (Figure 1) posits that three independent variables—Transparency, Accountability, and Automation—directly influence the dependent variable, Procurement Irregularities. Crucially, Institutional Governance is positioned as a moderating variable that strengthens the relationship between the independent variables and the reduction of irregularities.

Figure 1: Conceptual Framework

text
INDEPENDENT VARIABLES

| Transparency |

| Accountability |———————| REDUCTION IN PROCUREMENT
                           IRREGULARITIES |

| Automation |
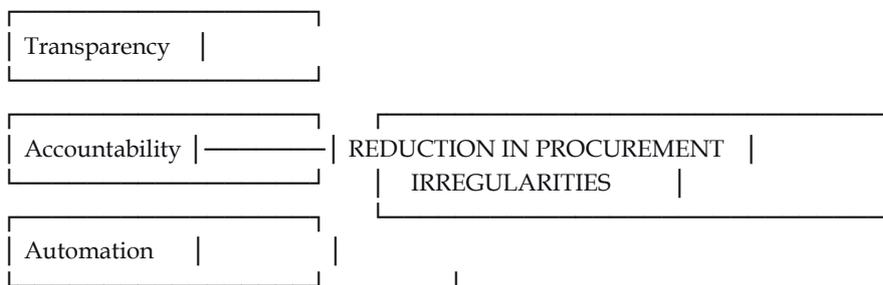
MODERATING VARIABLE: ———————————————
    Institutional Governance

<h3 style="text-align:center">III.   Methodology</h3>

A mixed-methods research design was employed to provide a comprehensive analysis. The study was conducted at KETRACO.

Population and Sampling: The target population consisted of all personnel involved in the procurement lifecycle. A census survey was used for the quantitative phase, ensuring all members of procurement, tender, and evaluation committees were included (N=85). For the qualitative phase, purposive sampling was used to select 10 key informants with deep institutional knowledge.

Data Collection: Quantitative data were collected using a structured questionnaire with a 5-point Likert scale. Qualitative data were gathered through semi-structured interviews.

Data Analysis: Quantitative data were analyzed using SPSS. Descriptive statistics summarized the data. Reliability was tested using Cronbach's Alpha. Pearson's Correlation and Multiple Linear Regression were used to test relationships and predictive power. Hierarchical regression was used for moderation analysis. Qualitative data were analyzed thematically to triangulate and enrich the quantitative findings.

<h3 style="text-align:center">IV.   Results and Findings</h3>

4.1 Descriptive Statistics

Respondents perceived the governance features as strong:

- **Transparency** had the highest mean (4.05), indicating that procurement information was easily accessible and processes were visible.
- **Automation** followed closely (mean = 3.95), suggesting that system-driven processes were effective.
- **Accountability** (mean = 3.85) and **Institutional Governance** (mean = 3.75) were also rated moderately high.
- **Procurement Irregularities** were generally low (mean = 2.88), suggesting the system's overall effectiveness.

4.2 Reliability and Validity

Cronbach's Alpha values for all constructs were above 0.7 (Transparency=0.82, Accountability=0.79, Automation=0.81, Institutional Governance=0.77, Procurement Irregularities=0.74), confirming the instrument's internal consistency.

4.3 Correlation Analysis

All governance features showed a significant negative correlation with procurement irregularities:

- Transparency: r = -0.52
- Automation: r = -0.50
- Accountability: r = -0.48
- Institutional   Governance: r   =   -0.45
  This indicates that as the strength of these features increases, procurement irregularities decrease.

4.4 Regression Analysis

A multiple regression model was significant (F = 21.84, p < 0.001) and explained 52% of the variance in procurement irregularities (R^2 = 0.52). All variables were significant negative predictors:

- Transparency (β = -0.32, p = 0.001)
- Automation (β = -0.30, p < 0.001)
- Accountability (β = -0.25, p = 0.003)
- Institutional Governance (β = -0.21, p = 0.039)

4.5 Moderation Analysis

Hierarchical regression revealed that institutional governance significantly moderates the relationship between the key governance features and procurement irregularities. The interaction terms for Transparency × Institutional Governance (p = 0.019), Accountability × Institutional Governance (p = 0.031), and Automation × Institutional Governance (p = 0.011) were all significant and negative. This confirms that the negative effect of transparency, accountability, and automation on irregularities is stronger when institutional governance is robust.

4.6 Qualitative Findings

Thematic analysis of interviews provided context to the quantitative results. Key themes included:

- **Management Commitment:** The active oversight of senior management was cited as a critical driver for system adherence.

- **Policy Clarity:** Well-communicated and enforced procurement policies reduced ambiguity and opportunities for circumvention.
- **User Experience:** Challenges with the system's user-friendliness were noted as a reason some staff sought informal workarounds, aligning with the TAM theory.

V. Discussion

The findings strongly support the study's hypotheses. The significant negative relationships between transparency, accountability, automation, and procurement irregularities align with Agency Theory and prior empirical work (Ngugi, 2020; Friday et al., 2024). Transparency reduces information asymmetry, while accountability ensures actions are traceable and enforceable. Automation, as predicted by TAM, reduces manual intervention and opportunities for fraud when perceived as useful and easy to use.

The most critical finding is the moderating role of institutional governance. This suggests that the mere presence of technical features in an Automated Procurement system is insufficient. Their effectiveness is catalyzed by a strong institutional environment characterized by ethical leadership, effective oversight, clear policies, and a culture of compliance (Dyck et al., 2023). This explains why, at KETRACO, irregularities persisted despite the Automated Procurement system; the institutional governance, while moderately strong, had room for improvement, thereby limiting the system's full potential.

I. 6. Conclusion and Recommendations

6.1 Conclusion

This study concludes that governance features embedded in an Automated Procurement system—transparency, accountability, and automation—are effective in reducing procurement irregularities. However, their impact is not standalone; it is significantly amplified by the strength of the organization's institutional governance. An integrated approach that combines robust technical systems with a strong ethical and oversight framework is essential for sustainable procurement integrity.

6.2 Recommendations

- **Practical Recommendations:**
  o **For KETRACO/Policymakers:** Enhance institutional governance by strengthening internal audit functions, ensuring consistent enforcement of policies, and fostering a top-down culture of integrity. Invest in continuous user training to improve the perceived ease of use of the Automated Procurement system.
  o **System Design:** Redesign Automated Procurement workflows to be more intuitive and to structurally enforce compliance (e.g., system should not proceed to the next step without mandatory documentation).
- **Theoretical Recommendations:** Future research on technology-driven governance should incorporate institutional governance as a key moderating variable. The integrated framework presented here provides a model for such investigations.

6.3 Limitations and Future Research

The study's focus on a single state corporation limits generalizability. A cross-sectional design also restricts causal inference. Future research could employ longitudinal studies across multiple public entities to validate and extend these findings.

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