



Assessing the impact of E-Procurement Systems in Enhancing Procurement Efficiency among International Non-Governmental Organizations in Nigeria

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ABSTRACT

This article analyses how e-procurement systems influence procurement efficiency and governance outcomes in international non-governmental organisations (INGOs) operating in Nigeria. Drawing on the Resource-Based View (RBV), Technology Acceptance Model (TAM) and Diffusion of Innovations (DoI), e-procurement is conceptualised as a strategic digital capability that can reshape cost structures, process speed, transparency and accountability in aid-funded operations (Barney, 1991; Rogers, 2003; Davis, 1989). A cross-sectional survey of staff in 96 INGOs and UN agencies yielded 81 valid responses from organisations using e-procurement, analysed via multiple linear regression. E-procurement adoption has a very strong positive effect on cost reduction ($R^2 = 0.771$; $\beta = 0.865$; $p < 0.001$), a moderate effect on procurement process speed ($R^2 = 0.275$; $\beta = 0.422$; $p < 0.001$), and modest but significant effects on transparency ($R^2 = 0.131$; $\beta = 0.298$; $p = 0.001$) and accountability ($R^2 = 0.138$; $\beta = 0.315$; $p < 0.001$). Classical regression assumptions are largely satisfied, although Durbin-Watson statistics below 1.0 for the transparency and accountability models point to residual autocorrelation. The article argues that in Nigeria's demanding operating environment, e-procurement is both an efficiency tool and a governance mechanism, but its developmental contribution depends on accompanying investments in institutional capacity, infrastructure and regulatory alignment. Implications for NGO managers, donors and policymakers concerned with stability and development are discussed.

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INTRODUCTION

Digitisation is reshaping organisational processes worldwide, from industrial automation to back-office administration (Huth, Knauer, & Ruf, 2019). Procurement has been at the centre of this transformation, as organisations adopt e-procurement platforms to automate sourcing, tendering, ordering and payment (Davila, Gupta, & Palmer, 2003; Jahani et al., 2021).

In Nigeria, INGOs operate in a complex regulatory and infrastructural environment, facing high expectations of cost-effectiveness, speed, and probity in the use of donor funds (Banks, Hulme, & Edwards, 2015; Ojo, Adebayo, & Salami, 2018). Traditional paper-based procurement is vulnerable to delay, error and fraud (Knoepfel, 2016).

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While e-procurement has been widely studied in governments and corporations (Gunasekaran & Ngai, 2008; Vaidya, Sajeev, & Callender, 2006), there is far less evidence for INGOs in African contexts (Akinwale, 2020; Okoro, 2023). This article addresses that gap by asking: how do e-procurement systems affect cost reduction, process speed, transparency and accountability in INGOs in Nigeria, and what are the implications for governance, stability and development?

Theoretical Framework

The analysis is anchored in three complementary perspectives. TAM posits that technology use is driven by perceived usefulness and ease of use (Davis, 1989), variables central to frontline staff acceptance of new procurement platforms. Diffusion of Innovations theory explains how technologies spread through organisational fields depending on perceived relative advantage, compatibility and observability (Rogers, 2003).

RBV treats e-procurement as a bundle of digital resources and capabilities - software, data, skills and routines - that can generate sustained advantage when they are valuable, rare, inimitable and non-substitutable (Barney, 1991; Bharadwaj, 2000). In INGOs, e-procurement capabilities can underpin more efficient, transparent and accountable deployment of resources in fragile environments.

Literature and Context

Global evidence links e-procurement to reduced transaction costs, shorter cycle times and improved supplier coordination (Gunasekaran & Ngai, 2008; Chong et al., 2011) and to enhanced transparency through digital audit trails and electronic tendering (O'Loughlin & O'Neill, 2014; OECD, 2022).

In Nigeria, studies on public bodies and NGOs find that e-procurement can improve performance but faces barriers including poor ICT infrastructure, limited skills, resistance to change and regulatory ambiguity (Akinwale, 2020; Michael, Nmecha, & Nmecha, 2020; Musa, Jaafar, & Raslim, 2022). Yet few studies focus specifically

on INGOs that must reconcile international donor rules with Nigerian procurement law and operate in insecure, infrastructure-poor regions.

The present study contributes by focusing on international NGOs and UN agencies, operationalising e-procurement use across multiple functionalities, and analysing efficiency and governance outcomes together.

METHODOLOGY

A quantitative cross-sectional survey design was adopted to assess the effect of e-procurement adoption on procurement outcomes among INGOs and UN agencies in Nigeria (Creswell, 2014). The population comprised 96 organisations - 58 INGOs, 9 humanitarian organisations and 29 UN agencies - identified from the INGO Forum and UNDSS listings.

Using Cochran's formula for finite populations, a sample size of 77 organisations was calculated; simple random sampling was used to select respondents involved in procurement, finance, IT and operations (Cochran, 1977). One hundred questionnaires were distributed via Google Forms; 81 valid responses from organisations using e-procurement (81% valid response rate) were retained for analysis.

The instrument comprised Likert-scale items on (i) utilisation of e-procurement functionalities; (ii) cost reduction; (iii) process speed; (iv) transparency; and (v) accountability. Composite indices for e-procurement system adoption (EPS) and each outcome (CRD, PPS, TRN, ACC) were computed as means. Reliability and validity were checked via expert review and internal consistency tests (Nunnally & Bernstein, 1994).

Simple linear regressions were estimated with EPS as predictor and each outcome as dependent variable, using SPSS 26. Assumptions of linearity, normality, homoscedasticity, multicollinearity and independence of errors were examined. Models for cost reduction and process speed met all



assumptions; transparency and accountability models showed positive autocorrelation (Durbin-Watson $\approx 0.72-0.73$).

The general model was expressed as:
 $PE = \beta_0 + \beta_1 EPS + \varepsilon$

Where:

PE = Procurement Efficiency Dimension

EPS = E-Procurement Systems

β_0 = Constant

β_1 = Regression Coefficient

ε = Error Term

The decision rule was based on a significance level of 0.05.

RESULTS

Table 1: Summary of Regression Results

Variables	R	R ²	Beta (β)	p-value	Decision
Cost Reduction	0.878	0.771	0.865	<0.001	Significant
Procurement Process Speed	0.525	0.275	0.422	<0.001	Significant
Transparency	0.362	0.131	0.298	0.001	Significant
Accountability	0.372	0.138	0.315	<0.001	Significant

E-procurement adoption

E-procurement is widespread: 92% of surveyed NGOs reported using some form of e-procurement; off-the-shelf suites (SAP Ariba, Oracle), custom-built systems and web-based vendor portals were most common. Most organisations reported high or very high utilisation of electronic requisitioning, e-tendering, PO generation, e-invoicing, spend analysis and integration with other systems, though some advanced functions showed uneven uptake.

Cost reduction

E-procurement adoption has a very strong, statistically significant effect on organisational cost reduction ($R = 0.878$; $R^2 = 0.771$; $\beta = 0.865$; $p < 0.001$). Respondents perceived high or very high-cost savings from reduced administrative and transaction costs, fewer errors and penalties, lower travel and communication costs, and improved compliance (over 50 respondents in each case).

Procurement process speed

The model for process speed indicates a moderate positive relationship ($R = 0.525$; $R^2 = 0.275$; $\beta = 0.422$; $p < 0.001$) with satisfactory diagnostics (Durbin-Watson = 2.034). Across seven indicators-requisition approvals, tendering cycles, supplier onboarding, PO generation,

invoicing, overall lead time and access to data-most respondents reported high or very high improvements; for example, 79% for expedited invoice processing and 77% for faster access to procurement data and reports.

Transparency and accountability

E-procurement adoption is positively associated with transparency ($R^2 = 0.131$; $\beta = 0.298$; $p = 0.001$) and accountability ($R^2 = 0.138$; $\beta = 0.315$; $p < 0.001$). Descriptive data show strong perceived gains: 67% reported high or very high improvements in audit trails and record-keeping, 78% in monitoring supplier performance, 74% in adherence to policies, and 73-84% for accountability indicators such as clearer responsibility and visibility of activities.

Improvements in perceived reduction of corruption were somewhat lower (around three-quarters reporting high or very high extent) and residual diagnostics for both models suggest positive autocorrelation, indicating omitted organisational or contextual variables.

DISCUSSION OF FINDINGS

The findings reinforce global evidence that e-procurement can substantially improve cost efficiency and process speed while strengthening governance (Gunasekaran & Ngai, 2008; Vaidya et al., 2006; OECD, 2022). In RBV terms, INGOs

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that invest in integrated procurement platforms and associated skills appear able to convert these into tangible performance gains in a resource-constrained, high-risk environment (Bharadwaj, 2000).

However, the much higher R^2 for cost reduction than for transparency and accountability suggests that efficiency gains are easier to achieve than governance gains. Transparency and accountability depend not only on digital trails and standardised workflows but also on leadership commitment, internal audit capability, organisational culture and external enforcement (Ebrahim, 2003; Thai, 2008). The autocorrelation in governance models indicates that time-dependent or institution-specific dynamics - such as reforms, audits or scandals - may also shape outcomes.

For stability and development, this dual nature of e-procurement is important. In conflict-affected or politically contested regions, rapid and visible delivery of services can support social stability, while perceived opacity in NGO procurement can fuel mistrust. E-procurement, when embedded in robust governance frameworks, can therefore reinforce both operational effectiveness and the legitimacy of development actors.

Policy and Practice Implications

For NGO leaders, e-procurement should be treated as a strategic, organisation-wide transformation rather than a narrow IT initiative. Strong executive sponsorship, cross-functional implementation teams and sustained capacity building are required to realise both efficiency and governance benefits (Puschmann & Alt, 2005; Florian & Martin, 2020).

Donors and regulators should align compliance frameworks with digital tools, funding not only software licences but also connectivity, training and integration with national procurement regimes (Federal Republic of Nigeria, 2019; OECD, 2022). Harmonised expectations can reduce duplication and facilitate interoperability between NGO systems and government reforms. Finally, future research should adopt longitudinal

and mixed-methods designs to unpack causal pathways and explore sectoral differences and political-economic dynamics of digital procurement in fragile settings (Mikalef et al., 2019).

CONCLUSION

E-procurement systems in INGOs in Nigeria deliver substantial cost and speed gains and meaningful, if more modest, improvements in transparency and accountability. In line with AJSD's focus on stability and development, these systems should be understood as part of a broader governance infrastructure: their contribution to development depends on how well digital capabilities are integrated with institutional reforms, regulatory frameworks and local accountability mechanisms.

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