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SYSTEM AND OFFICER QUALITY AS DETERMINANTS OF CITIZENS' PERCEIVED USEFULNESS AND EASE OF USE OF E-VOTER REGISTRATION SYSTEMS IN NIGERIA

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ABSTRACT

The digitization of voter registration is increasingly adopted as a strategy to improve transparency, reduce fraud, and enhance electoral participation. In Nigeria, the Independent National Electoral Commission (INEC) introduced the e-voter registration system to overcome challenges associated with manual processes. However, the extent to which citizens perceive the system as useful and easy to use depends on both system-related and human factors. Guided by the Technology Acceptance Model (TAM), this study investigates the influence of system quality and officer quality on citizens' perceived usefulness and perceived ease of use of the e-voter registration system. Data were collected from 400 eligible voters across six Nigerian states using a structured questionnaire. Structural Equation Modeling (SEM) with AMOS was employed to test the hypothesized relationships. Findings revealed that system quality significantly and positively influences both perceived usefulness ($\beta = 0.43$, $p < 0.001$) and perceived ease of use ($\beta = 0.38$, $p < 0.001$). Officer quality also exhibited significant positive effects on perceived usefulness ($\beta = 0.41$, $p < 0.001$) and perceived ease of use ($\beta = 0.36$, $p < 0.001$). The model explained 38% of the variance in perceived usefulness ($R^2 = 0.38$) and 34% in perceived ease of use ($R^2 = 0.34$). The study emphasizes the dual importance of robust system design and competent electoral officers in enhancing citizens' acceptance of e-voter registration systems. Policy implications include continuous

system upgrades, targeted officer training, and citizen-centered system design to strengthen electoral credibility.

Keywords: e-voter registration, system quality, officer quality, perceived usefulness, perceived ease of use, structural equation modelling, Nigeria

INTRODUCTION

The quality of democratic governance in Nigeria is closely tied to the credibility of its electoral management, particularly the integrity of voter registration. Since 2021, the Independent National Electoral Commission (INEC) has complemented in-person capture with an online Continuous Voter Registration (CVR) portal that enables citizens to initiate registration, verify records, request transfers, and track Permanent Voter Card (PVC) status—efforts aimed at reducing duplication and enhancing accessibility for dispersed populations (INEC, 2021; Orji, 2022). INEC's official post-election report for the 2023 general elections emphasizes the centrality of digital systems—including the Voter Enrollment Device during registration and the Bimodal Voter Accreditation System (BVAS) during accreditation—in safeguarding electoral integrity, despite implementation challenges (INEC, 2023). External observers, such as the European Union Election Observation Mission (2023) and the Commonwealth Observer Group (2023), echoed these findings, recognizing the transformative scale of electoral technology while cautioning that system inconsistencies undermined citizens' trust.

Yet, citizens' adoption of digital electoral services is far from guaranteed. Contemporary e-government scholarship reinforces the Technology Acceptance Model (TAM), which posits that perceived usefulness and perceived ease of use are critical determinants of technology acceptance (Davis, 1989). Recent studies across Africa and Asia confirm that when digital platforms are seen as reliable, efficient, and effort-saving, intention to use increases significantly (Oni et al., 2022; Yakubu & Dasuki, 2018; Wahid et al., 2023). In the electoral domain, adoption depends not only on the technical system quality (reliability, accessibility, responsiveness, and security) but also on officer quality (competence, professionalism, and courtesy). For instance, empirical evidence from the 2023 elections shows that BVAS performance and the technical support provided by officers jointly influenced citizens' perceptions of electoral credibility (Oladapo, 2023).

The Nigerian context makes this dual influence more pressing. Despite rising mobile and internet penetration, digital literacy remains uneven across regions, gender, and socio-economic groups (ITU, 2022; World Bank, 2023). Studies reveal that about one-third of Nigerians have limited digital skills, particularly in rural areas (OECD, 2021). This implies that user-friendly system design must be complemented by officer assistance to ensure equitable access (Adebayo & Omotayo, 2022). Moreover, ongoing digital inclusion initiatives, such as the Nigeria Digital Economy Policy and Strategy (NDEPS), highlight the importance of simplifying workflows and providing multilingual and accessible services to encourage citizen adoption (Federal Ministry of Communications and Digital Economy, 2020).

While existing literature acknowledges the role of technology, there is a gap in understanding the specific weight of human intervention (officer quality) versus technical functionality (system quality) in low-literacy contexts. Some studies suggest technology alone drives adoption (Bayode, 2020), while others argue human support is the primary determinant (Ojo, 2019). This study seeks to resolve this ambiguity. Accordingly, this study applies the Technology Acceptance Model (TAM) to examine how system quality and officer quality influence citizens' perceived usefulness and perceived ease of use of the e-voter registration system in Nigeria. Using Structural Equation Modelling (SEM) with a sample of 400 respondents, this research empirically validates the hypothesis that robust system design and competent officer support are complementary factors shaping adoption. By integrating both technical and human-service dimensions, this work extends electoral technology adoption literature and provides actionable insights for strengthening voter registration credibility in Nigeria.

OBJECTIVES OF THE STUDY

The specific objectives are to:

1. Examine the influence of system quality on citizens' perceived usefulness of the e-voter registration system.
2. Investigate the influence of system quality on citizens' perceived ease of use of the e-voter registration system.
3. Assess the influence of officer quality on citizens' perceived usefulness of the e-voter registration system.
4. Determine the influence of officer quality on citizens' perceived ease of use of the e-voter registration system.

RESEARCH QUESTIONS

1. How does system quality influence citizens' perceived usefulness of the e-voter registration system?
2. How does system quality affect citizens' perceived ease of use of the e-voter registration system?
3. What is the relationship between officer quality and citizens' perceived usefulness of the e-voter registration system?
4. What is the relationship between officer quality and citizens' perceived ease of use of the e-voter registration system?

HYPOTHESES

H1a: System quality has a positive and significant influence on citizens' perceived usefulness of the e-voter registration system.

H1b: System quality has a positive and significant influence on citizens' perceived ease of use of the e-voter registration system.

H2a: Officer quality has a positive and significant influence on citizens' perceived usefulness of the e-voter registration system.

H2b: Officer quality has a positive and significant influence on citizens' perceived ease of use of the e-

voter registration system.

LITERATURE REVIEW

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) developed by Davis (1989) has become one of the most influential frameworks in explaining technology adoption. It posits that perceived usefulness (PU) and perceived ease of use (PEOU) predict users' attitudes and behavioral intention to use technology. In public service contexts, these constructs provide insight into how citizens evaluate new e-government platforms.

System Quality in E-Governance

System quality reflects the technical functionality and performance of an information system, including accessibility, responsiveness, security, and user-friendliness (DeLone & McLean, 2003). A reliable system enhances citizens' confidence and encourages adoption, while poor system quality reduces trust and usability. In e-government settings across developing countries, unreliable systems have been found to deter participation (Asogwa, 2014).

Officer Quality and Service Delivery

Officer quality refers to the competence, professionalism, and responsiveness of officials managing technology-supported services. Research has shown that even when systems are well designed, users' experiences depend significantly on staff who provide guidance (Ojo, 2019). In Nigeria, where digital literacy gaps persist, officer quality is vital in influencing whether citizens perceive e-voter registration as accessible and useful.

Empirical Studies

A growing body of empirical studies demonstrates that both system quality and officer quality are fundamental to predicting the adoption of e-governance and e-voting technologies in Africa. For instance, Amoani-Arthur, Essien, and Omari (2016) showed that Ghanaian citizens' acceptance of e-voting platforms was shaped by the technical reliability of the system as well as the competence of staff involved. In parallel, Bayode (2020) found that system responsiveness and officer support had a powerful impact on Nigerians' trust in e-voting technology. Building on these findings, more recent research underscores the combined influence of these factors. In Ghana, Kubuga, Abdul-Rahman, and Armah (2023) highlighted that readiness for electronic voting depends not only on the reliability of technical systems but also on the visible commitment and preparedness of stakeholders, particularly staff, for upcoming elections. Studies in Nigeria by Adeshina (2020, 2014) and Ishaq (2016) similarly revealed that dependability, fraud prevention, and usability—when paired with strong regulatory support, transparency, and active staff engagement—greatly enhance citizens' willingness to embrace e-voting platforms. Further, Nnaeto and Ndoh (2018) emphasized that positive officer attitudes and clear communication strengthen perceptions of election credibility and technology acceptance. Taken together, these works affirm that integrating robust system features with effective, supportive human interactions is crucial for fostering public confidence and accelerating the widespread adoption of e-governance and electoral innovations across Africa.

METHODOLOGY

Research Design

This study employed a quantitative survey design, consistent with prior TAM-based adoption studies.

Population and Sample

The population comprised eligible voters in Nigeria. Using stratified random sampling across six geo-political zones, 400 respondents were selected to ensure representation across gender, age, education, and urban-rural residence. The sample size was determined following Krejcie and Morgan's (1970) guidelines.

Ethical Considerations

Ethical approval for this study was obtained from the Institutional Review Board of the American University of Nigeria. Informed consent was sought from all participants prior to data collection. Participants were assured of confidentiality and anonymity, and they were informed of their right to withdraw from the study at any point without penalty.

Instrumentation

A structured questionnaire was developed with four major constructs: System Quality (SQ), Officer Quality (OQ), Perceived Usefulness (PU), and Perceived Ease of Use (PEOU). Items were adapted from validated TAM instruments and related studies (DeLone & McLean, 2003; Davis, 1989). Responses were measured on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Validity and Reliability

Content validity was established through expert review by electoral management scholars and INEC officials. Construct validity was assessed using Confirmatory Factor Analysis (CFA). Reliability was confirmed with Cronbach's alpha, with all constructs exceeding the recommended 0.70 threshold: SQ = 0.82, OQ = 0.84, PU = 0.79, PEOU = 0.81.

Common Method Bias (CMB)

Given that data were collected using a single instrument at one point in time, Harman's single-factor test was conducted to assess Common Method Bias. The results indicated that no single factor accounted for the majority of the covariance (the first factor explained 28.4% of the variance, which is below the 50% threshold), suggesting that CMB is not a significant concern in this study.

Data Analysis

Data analysis was conducted using Structural Equation Modelling (SEM) with AMOS. The analysis followed a two-step approach:

1. Measurement Model: CFA was performed to test construct validity and model fit.
2. Structural Model: Hypothesized relationships were tested using path analysis. Model fit indices used include CFI, TLI, RMSEA, and χ^2/df.

RESULTS

Demographic Profile of Respondents

Table 1 presents the demographic characteristics of the 400 respondents. The sample reflects a balanced distribution across gender and geo-political zones, with a significant proportion of respondents residing in urban areas and possessing secondary or tertiary education.

Table 1: Demographic Characteristics of Respondents (N=400)

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Table 1: Demographic Characteristics of Respondents (N=400)	**Category**	**Frequency**	**Percentage (%)**
Table 1: Demographic Characteristics of Respondents (N=400)	Male	210	52.5
	Female	190	47.5
Age	18-25	120	30
	26-35	150	37.5
	36-45	80	20
	46 and above	50	12.5
Education	Secondry	140	35
	Tertiary	260	65
Residence	Urban	240	60
	Rural	160	40
Geo-Political Zone	North West	65	16.25
	North East	65	16.25
	North Central	65	16.25
	South West	65	16.25
	South East	65	16.25
	South South	75	18.75

Measurement Model

The CFA results showed satisfactory model fit: $\chi^2/df = 2.11$, CFI = 0.95, TLI = 0.93, RMSEA = 0.052. All factor loadings exceeded 0.60 and were statistically significant ($p < 0.001$), confirming convergent validity. Average Variance Extracted (AVE) values ranged from 0.54 to 0.62, exceeding the 0.50 benchmark.

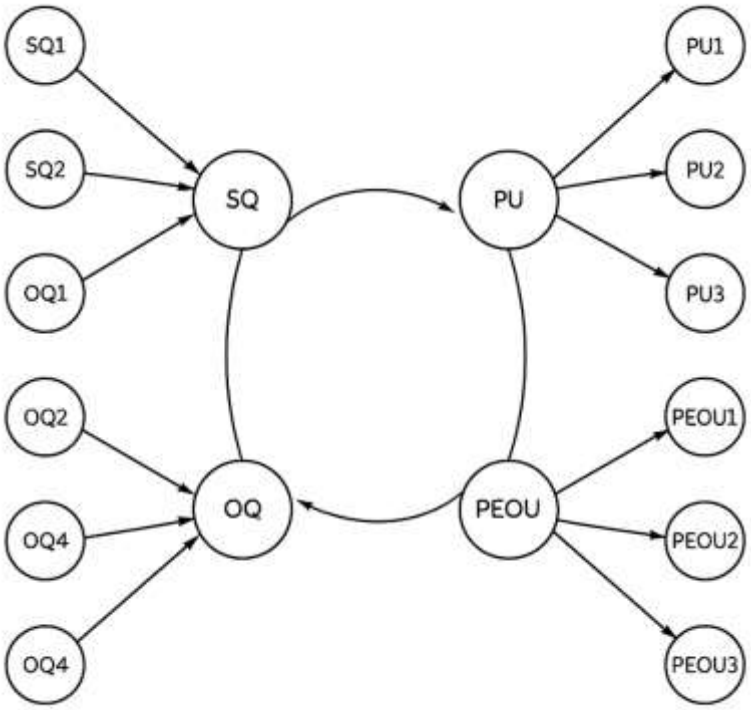
Structural Model

The structural model also demonstrated good fit ($\chi^2/df = 2.24$, CFI = 0.94, TLI = 0.92, RMSEA = 0.056). Path coefficients were as follows:

1. H1a (SQ → PU): $\beta = 0.43$, $p < 0.001$ (supported)
2. H1b (SQ → PEOU): $\beta = 0.38$, $p < 0.001$ (supported)
3. H2a (OQ → PU): $\beta = 0.41$, $p < 0.001$ (supported)
4. H2b (OQ → PEOU): $\beta = 0.36$, $p < 0.001$ (supported)

These results indicate that both system quality and officer quality significantly influence citizens' perceptions of the e-voter registration system.

Figure 1: Structural Equation Model (SEM) Path Diagram



(Note: The figure illustrates the path coefficients between system quality, officer quality, perceived usefulness, and perceived ease of use as described in the structural model results above.)

DISCUSSION

The findings affirm the Technology Acceptance Model's assertion that system-related and human factors determine perceptions of technology. Consistent with previous studies (Amoani-Arthur, Essien & Omari, 2016; Bayode, 2020; Adeshina, 2020), system quality emerged as a strong predictor of perceived usefulness and ease of use. This underscores the need for INEC to maintain a stable, reliable, and user-friendly e-registration platform.

Officer quality was also found to be critical, suggesting that technical support and interpersonal skills of officers strongly shape citizens' perceptions. Notably, the path coefficients for Officer Quality ($\beta = 0.41$ on PU) were nearly equivalent to those of System Quality ($\beta = 0.43$ on PU). This near parity suggests that in the Nigerian context, the human element is almost as vital as the technical infrastructure. This can be attributed to the digital literacy gap highlighted in the introduction; where citizens lack confidence in navigating digital interfaces, competent officers serve as the necessary bridge between the citizen and the digital platform. Their competence and professionalism determine whether citizens perceive the system as beneficial and easy to use. This finding aligns with Ojo (2019) but offers a more quantified emphasis on the weight of officer quality in electoral specific contexts compared to general e-government studies.
The dual importance of system and officer quality demonstrates that electoral technology adoption requires a sociotechnical approach that simultaneously strengthens infrastructure and human capacity. Ignoring either dimension risks undermining the credibility of the electoral process.

CONCLUSION

This study concludes that both system quality and officer quality significantly influence citizens' perceived usefulness and perceived ease of use of the e-voter registration system in Nigeria. Successful adoption therefore depends not only on the robustness of the system but also on the competence of officers facilitating registration.

RECOMMENDATIONS

1. System Enhancement: INEC should continuously upgrade the e-registration system to improve accessibility, reliability, and security.
2. Capacity Development: Regular training for registration officers on both technical and interpersonal skills is essential.
3. User-Friendly Design: Simplified interfaces should be developed to accommodate users with varying levels of digital literacy.
4. Feedback Mechanisms: Establish channels for citizens to provide feedback on both system and officer performance.
5. Policy Integration: Government should institutionalize ICT investment and staff training as a core element of electoral reforms.

Declarations: All authors declare that they have no conflicts of interest.

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