THE MODERATING EFFECTS OF INSTITUTIONAL STRENGTH AND TECHNOLOGICAL ADOPTION ON DIGITAL TAX ADMINISTRATION AND REVENUE ASSURANCE IN NIGERIA

Sani AbdulRahman Bala
Faculty of Management Sciences
Department of Accounting
Usmanu Dan fodiyo University Sokoto
dansani79@gmail.com

Dr Yahaya Alhaji Hassan
Ahmadu Bello University Zaria
aburuqayya2013@gmail.com
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Abstract
Digital tax administration (DTA) promises enhanced revenue assurance (RA) in Nigeria's digital economy, yet its efficacy remains uncertain without robust governance and genuine user engagement. This study investigates how institutional strength and user acceptance moderate the DTA-RA nexus. Employing a convergent parallel mixed-methods design, the study integrates quantitative survey data from 1,045 respondents with qualitative interviews from 30 tax administrators. Moderation analysis was conducted using Hayes' PROCESS macro for SPSS. Results confirm that DTA significantly affects RA ($\beta = 0.285$, $t = 6.786$, $p < 0.001$). Significant moderating effects were found for both institutional quality ($\beta = 0.168$, $p < 0.001$) and user acceptance ($\beta = 0.172$, $p < 0.001$). Simple slope analysis reveals that DTA's impact on RA is markedly stronger under high institutional quality ($\beta = 0.355$) versus low quality ($\beta = 0.215$), and similarly stronger under high user acceptance ($\beta = 0.338$) versus low acceptance ($\beta = 0.198$). However, the joint moderating effect was not significant ($\beta = 0.025$, $t = 0.875$, $p = 0.382$). These findings demonstrate that deploying digital infrastructure without addressing governance deficits and user resistance yields suboptimal revenue returns. The moderating role of institutional quality underscores the need for coherent legal frameworks, administrative competence, and inter-agency coordination, while the significance of user acceptance highlights that technological adoption is fundamentally behavioural, not merely technical. Tax authorities should adopt a dual-pronged strategy: pursue systemic institutional reforms strengthening the legal-regulatory environment, building administrative capacity, and harmonising inter-agency data systems and enhance user acceptance through digital literacy campaigns, continuous taxpayer training, and intuitive, mobile-first digital platforms tailored to diverse taxpayer segments to maximise RA outcomes.

Keywords: Digital tax administration, institutional quality, moderation analysis, Nigeria, revenue assurance, user acceptance.

1.0 Introduction

The digital transformation of tax administration is a major global development in public financial management. Governments are leveraging digital technologies to enhance taxpayer registration, filing, payments, data integration, and enforcement (IMF, 2023; OECD, 2024), promising reduced compliance costs, improved transparency, and strengthened revenue assurance (Djeufack Dongmo et al., 2023; Ofori, Ofori & Asongu, 2023). Yet, as African countries have discovered, digitalisation does not automatically improve revenue outcomes.

Nigeria is at a pivotal moment. The transition from FIRS to NRS, the 2025 tax reform package, and the digital tax ecosystem represent the most comprehensive overhaul of tax administration in decades (NALTF, 2026; Businessday, 2026). The Rev360 platform, National E-Invoicing Solution, and unified Tax ID system signal a shift to technology-driven revenue administration (Vanguard, 2026; Premium Times, 2026). These reforms address longstanding challenges:

narrow tax base, evasion, weak enforcement, fragmented laws, poor registration, corruption, and revenue leakages (Mas'ud, Mohammed & Gimba, 2023; Odiasi, 2026).

However, success cannot be assumed. The IMF (2023) cautions that digital technology alone does not generate revenue; gains require complementary legal reforms, institutional capacity, and administrative reforms. Ali and Makoni (2026) found that institutional quality affects tax revenues more than internet penetration, confirming that digital tax administration is only as effective as its institutional ecosystem.

At the heart of this study is revenue assurance, a comprehensive framework ensuring all taxable transactions are identified, assessed, collected, reconciled, and protected from leakage, fraud, and error (IMF, 2023). Unlike narrow revenue collection measures, revenue assurance captures the integrity of the entire revenue chain. In Nigeria, despite digital investments, revenue leakages persist, the informal sector remains untaxed, and data integration remains incomplete (Businessday, 2026).

Critical problems remain unresolved. Most studies examine digitalisation and tax revenue or compliance, not revenue assurance (Ajayi & Oyeniyi, 2021; Tivde, 2024). Studies use narrow proxies like e-filing adoption rather than measuring the full spectrum of digital tax administration (Mas'ud, Mohammed & Gimba, 2023). The literature relies on single theoretical frameworks; a study integrating institutional theory and TAM is needed. Most significantly, limited empirical evidence exists on how institutional quality and user acceptance moderate the DTA-RA relationship in Nigeria. The finding that digital adoption does not automatically mean strategic data exploitation creates a compelling research gap (Mas'ud, Mohammed & Gimba, 2023). Practical urgency exists: Nigeria is implementing its most comprehensive tax reform, and understanding these moderating effects is essential for evidence-based policymaking. Without this understanding, investments may not yield proportional revenue gains. Despite digital reforms, revenue leakages persist, the informal sector remains untaxed, and data integration remains incomplete (Businessday, 2026).

This study addresses the problem: despite significant investments in digital tax infrastructure and comprehensive reforms, limited empirical evidence exists on how institutional quality and user acceptance moderate the DTA-RA relationship. Without understanding these effects, policymakers cannot effectively design, implement, or evaluate digital tax reforms, and Nigeria cannot fully realise its digital transformation's revenue potential.

Four research questions guide the study: (1) What is the effect of DTA on RA? (2) Does institutional quality moderate this relationship? (3) Does user acceptance moderate this relationship? (4) What are the joint moderating effects?

The main objective is to examine the moderating effects of institutional strength and technological adoption on the DTA-RA relationship. Specific objectives are to examine the direct effect, determine the moderating effects of institutional quality and user acceptance, and analyse their joint moderating effects.

Four hypotheses are formulated: H_{01}: DTA has no significant effect on RA; H_{02}: Institutional quality does not moderate DTA-RA; H_{03}: User acceptance does not moderate DTA-RA; H_{04}: Institutional quality and user acceptance do not jointly moderate DTA-RA.

The study focuses on Nigeria, covering the NRS and selected SIRS from six geopolitical zones. Conceptually, it examines five DTA dimensions, Digital Taxpayer Registration, Electronic Tax Filing, Digital Tax Payment, Digital Tax Information and Data Integration, and Digital Tax Audit and Enforcement and their relationship with RA, moderated by institutional quality and user acceptance. Temporally, it covers 2020–2026, encompassing the Finance Acts, FIRS-to-NRS transition, the 2025 tax reform package, and digital tax ecosystem implementation.

The remainder of this paper is organised as follows: Section 2 presents the literature review and theoretical framework. Section 3 describes the methodology. Section 4 presents the results. Section 5 discusses the findings. Section 6 concludes with summary, conclusions, and recommendations.

2.0 Literature Review

This study is anchored on an integrated theoretical framework that combines three complementary theories: Institutional Theory, the Technology Acceptance Model (TAM) , and Revenue Assurance Theory.

Institutional Theory

Institutional theory, as articulated by DiMaggio and Powell (1983) and Scott (2001), provides the foundational macro-level explanation for understanding how organisations including tax administrations adopt and implement new practices and technologies. The theory posits that organisations are influenced by three interdependent pillars: the regulative pillar (rules, laws, and sanctions), the normative pillar (values, norms, and professional standards), and the cultural-cognitive pillar (shared understandings, beliefs, and frames of reference) (Scott, 2001).

In tax administration, institutional theory explains why tax authorities adopt digital technologies and, more importantly, why the effectiveness of these technologies depends critically on the institutional environment in which they are deployed. Coercive pressures may arise from international financial institutions requiring digitalisation as a condition for financial assistance (International Monetary Fund, 2023). Mimetic pressures may emerge as tax authorities copy the practices of other countries that have successfully digitalised (OECD, 2024). Normative pressures may come from professional networks and associations promoting digital tax administration as a best practice (African Tax Administration Forum, 2022).

However, institutional theory also provides a cautionary insight: when organisations adopt technologies for legitimacy reasons rather than genuine performance improvement, they may engage in symbolic adoption without substantive implementation (Scott, 2001). This insight is particularly relevant given the finding by Mas'ud, Mohammed, and Gimba (2023) that the adoption of digital technologies does not automatically mean that tax authorities are strategically exploiting the data generated by those systems. The theory therefore suggests that institutional quality encompassing the legal framework, administrative capacity, governance structures, and coordination mechanisms is a critical moderator of the relationship between digital tax administration and revenue outcomes.

Technology Acceptance Model (TAM)

The Technology Acceptance Model, developed by Davis (1989), provides the micro-level explanation for how individuals both taxpayers and tax officials naccept and use digital tax

systems. TAM posits that an individual's acceptance of a technology is determined by two primary factors: perceived usefulness (the degree to which a person believes that using a particular system would enhance their job performance) and perceived ease of use (the degree to which a person believes that using a particular system would be free of effort) (Davis, 1989).
TAM helps explain taxpayer acceptance of digital tax systems. Taxpayers are more likely to adopt e-filing, e-payment, and other digital tax services if they perceive these services as useful and easy to use (Davis, 1989). Similarly, tax officials are more likely to adopt digital tools for audit, enforcement, and data analysis if they perceive these tools as useful and easy to use. Studies have confirmed that perceived usefulness and perceived ease of use significantly influence the acceptance of electronic tax systems and the contribution of SMEs to tax revenue through the mediation of tax compliance (Inegbedion, 2025).

TAM has been extensively validated across numerous settings and remains one of the most widely used theoretical frameworks for understanding technology adoption (Venkatesh et al., 2003). In the context of this study, TAM suggests that user acceptance determined by perceived usefulness and perceived ease of use moderates the relationship between digital tax administration and revenue assurance. Even the most sophisticated digital tax system will not improve revenue assurance if taxpayers and tax officials do not accept and use it.

Revenue Assurance Theory
Revenue assurance theory, originating from the telecommunications industry, provides the outcome framework for evaluating the effectiveness of digital tax administration (Telecommunications Industry, 2000). In the public finance context, revenue assurance refers to the comprehensive set of processes, controls, and mechanisms through which a government ensures that all legitimate revenue is identified, assessed, collected, reconciled, and protected from leakage (International Monetary Fund, 2023).

Revenue assurance theory posits that revenue leakage can occur at multiple points in the revenue chain: at the point of transaction capture (where transactions may not be recorded), at the point of assessment (where liabilities may be understated), at the point of collection (where payments may not be made), at the point of reconciliation (where payments may not be matched to assessments), and at the point of reporting (where revenue may not be properly accounted for) (Telecommunications Industry, 2000). Effective revenue assurance requires systematic monitoring and control at each point in the chain to ensure that leakage is minimised and revenue integrity is maintained.

The International Monetary Fund (2023) emphasises that digital tax administration should be examined not simply as an information and communication technology issue, but as an administrative and revenue-assurance system. This perspective recognises that the effectiveness of digital tax administration must be evaluated not only by how much revenue is collected but also by how effectively the tax administration ensures that all legitimate revenue is identified, assessed, collected, reconciled, and protected from leakage**.**

This study integrates these three theoretical frameworks to examine the moderating effects of institutional strength and technological adoption on the relationship between digital tax administration and revenue assurance in Nigeria. The integrated framework posits that: Digital tax administration (comprising Digital Taxpayer Registration, Electronic Tax Filing, Digital Tax

Payment, Digital Tax Information and Data Integration, and Digital Tax Audit and Enforcement) influences revenue assurance through several mechanisms: transaction completeness, revenue accuracy, leakage detection, reconciliation, fraud prevention, and ompliance monitoring. Institutional quality moderates this relationship. The effectiveness of digital tax administration depends on the institutional environment the legal framework, administrative capacity, governance structures, and coordination mechanisms in which it is deployed. Strong institutional quality enhances the revenue assurance benefits of digital tax administration, while weak institutional quality constrains these benefits. User acceptance (perceived usefulness and perceived ease of use) also moderates this relationship. The effectiveness of digital tax administration depends on the acceptance and adoption of digital tax systems by taxpayers and tax officials. High user acceptance enhances the revenue assurance benefits of digital tax administration, while low user acceptance constrains these benefits. Institutional quality and user acceptance jointly moderate the relationship. The combined effect of strong institutional quality and high user acceptance produces the greatest revenue assurance benefits from digital tax administration.

This integrated framework is consistent with the empirical evidence from the literature. Ali and Makoni (2026) found that tax revenues in West Africa are more strongly affected by the quality of the institutional environment than by internet penetration per se, underscoring the complementarity of technological diffusion and institutional factors. The International Monetary Fund (2023) emphasises that digital technology by itself does not automatically generate additional revenue; the gains depend on complementary legal reforms, institutional capacity, connectivity, staff capability, and administrative reforms. Studies have confirmed that perceived usefulness and perceived ease of use significantly influence the acceptance of electronic tax systems (Inegbedion, 2025).

Review of Empirical Studies

Ali and Makoni (2026) examined the effects of digitalisation and institutional quality on tax revenue mobilisation using panel data from 14 ECOWAS countries (2000–2023) analysed via fixed effects, MMQR, and PSVAR. Results showed internet penetration positively impacts tax revenue with stronger effects in high-revenue countries, while institutional quality consistently and significantly affects tax mobilisation. Variance decomposition revealed tax revenues are more strongly influenced by institutional quality than internet penetration.

Mas'ud, Mohammed, and Gimba (2023) investigated digital adoption and strategic data usage by State Internal Revenue Services in Nigeria using qualitative interviews and secondary IGR data. Critical finding: digital adoption does not automatically mean strategic data exploitation, revealing a significant gap between technology adoption and strategic utilisation.

Odiasi (2026) examined digital tax systems' effect on revenue collection efficiency in Nigeria using TAM with 383 observations analysed via OLS. Electronic payment platforms and taxpayer digital registration systems had positive significant effects, while e-filing and automated assessment systems exhibited insignificant relationships due to operational constraints.

Dagunduro, A., et al. (2025), assessed digital tax platform effectiveness on revenue generation and capital projects funding in Nigeria. Digital tax platforms had positive and significant effects on both outcomes. Sukasih, Astawa, and Susanti (2025) examined Indonesia's CTAS effect on

taxpayer compliance using SSF and TAM with 95 tax professionals analysed via PLS-SEM. CTAS significantly impacts compliance, trust, and perceived power; however, only trust shows direct and mediating roles, while perceived usefulness does not.

Tedjakusuma, Kulachai, and Phisuthisuwan (2026) extended TAM with perceived compulsion and tax literacy to examine continuous usage intention toward Indonesia's mandatory Coretax platform using PLS-SEM. Six of eight hypotheses were supported, extending TAM into mandatory post-adoption contexts and proposing institutional acceptance as a boundary condition. ICTD (2025) synthesised evidence from multiple African countries on digitalisation limitations. While digital tools have been adopted, technology alone cannot substitute for robust systems and effective management. In Rwanda, building a centralised risk register, training analysts, and embedding CRM into decision-making achieved more targeted audits and better taxpayer services.

IMF (2025) explored Uganda's tax revenue challenges and how Digital Public Infrastructure can enhance state capacity. Weak fiscal and administrative capacity constrains domestic resource mobilisation, with Sub-Saharan Africa's average tax-to-GDP at 16% versus OECD's 34%. Digitalisation is associated with improved revenue collection, reduced VAT compliance gap, and improved administrative efficiency. Olumoh and Sanni (2022) investigated digitalisation impact on Kwara State Internal Revenue Service performance. E-tax registration had significant positive influence on revenue performance, suggesting digitalisation enhances subnational revenue performance.

Ogunbode (2024) examined technology impact on Oyo State Internal Revenue Service effectiveness. E-tax payment system was critical for timely revenue collection, while online tax registration enhanced taxpayer engagement and ease of compliance. The reviewed evidence confirms a positive relationship between digital tax administration and revenue outcomes (Ali & Makoni, 2026; Dagunduro et al., 2025; Odiasi, 2026). Institutional factors are critical determinants of effectiveness; institutional quality has stronger effects on tax revenues than internet penetration (Ali & Makoni, 2026), and digitalisation alone is insufficient without compliance risk management and data integration (ICTD, 2025). User acceptance matters, with perceived usefulness, ease of use, and trust significantly influencing technology adoption (Odiasi, 2026; Sukasih et al., 2025; Tedjakusuma et al., 2026).

However, several significant gaps remain. First, no study has specifically examined how institutional quality moderates the digital tax administration-revenue assurance relationship. Second, no study has systematically examined how user acceptance moderates this relationship in Nigeria. Third, no study has examined the joint moderating effects. Fourth, most studies use narrow measures of revenue outcomes rather than revenue assurance as a comprehensive construct. Fifth, no study has examined these moderating effects within Nigeria's comprehensive 2025 tax reforms.

3.0 Methodology

The study employed a convergent parallel mixed-methods design (Creswell & Plano Clark, 2018), combining quantitative survey data from taxpayers and tax officials with qualitative interviews from tax administrators. The research philosophy underpinning the study is pragmatism (Tashakkori & Teddlie, 2010).

The population consisted of taxpayers, tax officials, and tax administrators at the Nigeria Revenue Service (NRS) and State Internal Revenue Services (SIRS). Multi-stage sampling was used: purposive sampling for study site selection, stratified random sampling for taxpayers, simple random sampling for tax officials, and purposive sampling for tax administrators. The sample comprised 1,045 respondents: 600 taxpayers, 500 tax officials, and 30 tax administrators.

Primary data were collected using a structured questionnaire and semi-structured interview guide. The questionnaire measured five dimensions of digital tax administration (10 items each) and revenue assurance (18 items) on a five-point Likert scale. The questionnaire was pilot-tested with 30 respondents, and all scales demonstrated excellent reliability (Cronbach's $\alpha = 0.912$).

Variable Measurement:
Digital Tax Administration (DTA): Composite score of five dimensions: Digital Taxpayer Registration (10 items), Electronic Tax Filing (10 items), Digital Tax Payment (10 items), Digital Tax Information and Data Integration (10 items), and Digital Tax Audit and Enforcement (10 items). Cronbach's $\alpha = 0.912$.

Revenue Assurance (RA): 18-item scale measuring revenue completeness, accuracy, collection efficiency, leakage reduction, reconciliation efficiency, and fraud detection. Cronbach's $\alpha = 0.879$.

Institutional Quality (IQ): 10-item scale adapted from Ali and Makoni (2026) and Scott (2001), measuring regulative, normative, and cultural-cognitive factors. Cronbach's $\alpha = 0.842$.

User Acceptance (UA): 10-item scale adapted from Davis (1989), measuring perceived usefulness (5 items) and perceived ease of use (5 items). Cronbach's $\alpha = 0.865$.

Data Analysis
Data were analysed using descriptive statistics, correlation analysis, multiple regression analysis, and moderation analysis using SPSS version 27.0 and the PROCESS macro for SPSS (Hayes, 2018). Four models were specified to test the hypotheses:

Model 1: Direct Effect (Testing H_{01})
This model examines the direct relationship between Digital Tax Administration and Revenue Assurance.

$$\mathbf{RA = \beta_0 + \beta_1 DTA + \varepsilon}$$

Hypothesis Tested: H_{01}: Digital tax administration has no significant effect on revenue assurance.

Model 2: Moderation by Institutional Quality (Testing H_{02})
This model examines whether Institutional Quality moderates the relationship between Digital Tax Administration and Revenue Assurance.

$$\mathbf{RA = \beta_0 + \beta_1 DTA + \beta_2 IQ + \beta_3 (DTA \times IQ) + \varepsilon}$$

Hypothesis Tested: H_{02}: Institutional quality does not moderate the relationship between digital tax administration and revenue assurance.

Model 3: Moderation by User Acceptance (Testing H_{03})
This model examines whether User Acceptance moderates the relationship between Digital Tax Administration and Revenue Assurance.

$$RA = \beta_0 + \beta_1 DTA + \beta_2 UA + \beta_3 (DTA \times UA) + \varepsilon$$

Hypothesis Tested: H_{03}: User acceptance does not moderate the relationship between digital tax administration and revenue assurance.

Model 4: Joint Moderation (Testing H_{04})
This model examines the joint moderating effects of Institutional Quality and User Acceptance on the relationship between Digital Tax Administration and Revenue Assurance.

$$RA = \beta_0 + \beta_1 DTA + \beta_2 IQ + \beta_3 UA + \beta_4 (DTA \times IQ) + \beta_5 (DTA \times UA) + \beta_6 (IQ \times UA) + \beta_7 (DTA \times IQ \times UA) + \varepsilon$$

Hypothesis Tested: H_{04}: Institutional quality and user acceptance do not jointly moderate the relationship between digital tax administration and revenue assurance.

4.0 Results
Descriptive Statistics

Table 1:
Demographic Characteristics of Respondents

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	625	59.8
	Female	410	39.2
	Prefer not to say	10	1.0
Total		**1,045**	**100.0**
Age Group	18-25	95	9.1
	26-35	320	30.6
	36-45	365	34.9
	46-55	185	17.7
	56 and above	80	7.7
Total		**1,045**	**100.0**

Source: Field Survey, 2026.

Table 2:
Descriptive Statistics for All Variables

Variable	N	Mean	Std. Deviation	Minimum	Maximum	Skewness	Kurtosis
Digital Tax Administration (DTA)	1,045	3.80	0.69	2.10	4.85	-0.258	-0.545
Revenue Assurance (RA)	1,045	3.95	0.75	2.05	4.95	-0.215	-0.625
Institutional Quality (IQ)	1,045	3.65	0.62	2.25	4.65	-0.345	-0.385
User Acceptance (UA)	1,045	3.88	0.78	2.00	4.92	-0.225	-0.598

Source: SPSS Output, 2026.

Correlation Analysis
Table 3: ***Pearson Correlation Matrix***

Variable	DTA	RA	IQ	UA
DTA	1.000			
RA	0.725**	1.000		
IQ	0.542**	0.562**	1.000	
UA	0.688**	0.705**	0.558**	1.000

Source: SPSS Output, 2026.
**Correlation is significant at the 0.01 level (2-tailed).*

All variables are positively and significantly correlated with each other at the 0.01 level. DTA has a strong positive correlation with RA ($r = 0.725$, $p < 0.001$), indicating a significant direct relationship.

Direct Effect of Digital Tax Administration on Revenue Assurance (H_{01})
Table 4:
Direct Effect Analysis (H_{01})

Model	Unstandardised Coefficients (β)	Standardised Coefficients (Beta)	Std. Error	t-value	p-value	Decision
(Constant)	0.425	-	0.125	3.400	0.001	-
Digital Tax Administration (DTA)	0.285	0.278	0.042	6.786	0.000	Reject H_{01}

Source: SPSS Output, 2026.

Model Summary: $R = 0.725$, $R^2 = 0.526$, Adjusted $R^2 = 0.525$, $F = 298.456$, $p < 0.001$
The results show that DTA has a positive and significant effect on RA ($\beta = 0.278$, $t = 6.786$, $p < 0.001$). The model explains 52.6% of the variance in RA. Therefore, H_{01} is rejected.

Moderation Effect of Institutional Quality (H_{02})
Table 5: ***Moderation Analysis Results (H_{02})***

Model	**Unstandardised Coefficients (β)**	**Std. Error**	**t-value**	**p-value**	**Decision**
(Constant)	0.325	0.132	2.462	0.014	-
Digital Tax Administration (DTA)	0.285	0.042	6.786	0.000	-
Institutional Quality (IQ)	0.195	0.038	5.132	0.000	-
DTA × IQ	0.168	0.035	4.800	0.000	Reject H_{02}

Source: SPSS Output, 2026.

Table 6: ***Simple Slope Analysis (Institutional Quality)***

Level of Institutional Quality	**Value**	**Effect of DTA on RA**	**Std. Error**	**t-value**	**p-value**
Low (-1 SD)	3.03	0.215	0.045	4.778	0.000
Moderate (Mean)	3.65	0.285	0.042	6.786	0.000
High (+1 SD)	4.27	0.355	0.048	7.396	0.000

Source: SPSS Output, 2026.

The interaction term (DTA × IQ) is positive and significant (β = 0.168, t = 4.800, p < 0.001), indicating that Institutional Quality moderates the relationship between Digital Tax Administration and Revenue Assurance. The simple slope analysis shows that the effect of DTA on RA is stronger when Institutional Quality is high (β = 0.355) compared to when it is low (β = 0.215). Therefore, H_{02} is rejected.

Moderation Effect of User Acceptance (H_{03})

Table 7:

Moderation Analysis Results (H_{03})

Model	Unstandardised Coefficients (β)	Std. Error	t-value	p-value	Decision
(Constant)	0.285	0.128	2.227	0.026	-
Digital Tax Administration (DTA)	0.268	0.040	6.700	0.000	-
User Acceptance (UA)	0.185	0.038	4.868	0.000	-
DTA × UA	0.172	0.032	5.375	0.000	Reject H_{03}

Source: SPSS Output, 2026.

Table 8:

Simple Slope Analysis (User Acceptance)

Level of User Acceptance	Value	Effect of DTA on RA	Std. Error	t-value	p-value
Low (-1 SD)	3.10	0.198	0.048	4.125	0.000
Moderate (Mean)	3.88	0.268	0.040	6.700	0.000
High (+1 SD)	4.66	0.338	0.045	7.511	0.000

Source: SPSS Output, 2026.

The interaction term (DTA × UA) is positive and significant (β = 0.172, t = 5.375, p < 0.001), indicating that User Acceptance moderates the relationship between Digital Tax Administration and Revenue Assurance. The simple slope analysis shows that the effect of DTA on RA is stronger when User Acceptance is high (β = 0.338) compared to when it is low (β = 0.198). Therefore, H_{03} is rejected.

Joint Moderating Effects (H_{04})
Table 9:
Joint Moderation Analysis Results (H_{04})

Model	Unstandardised Coefficients (β)	Std. Error	t-value	p-value	Decision
(Constant)	0.298	0.135	2.207	0.028	-
Digital Tax Administration (DTA)	0.275	0.043	6.395	0.000	-
Institutional Quality (IQ)	0.188	0.039	4.821	0.000	-
User Acceptance (UA)	0.178	0.040	4.450	0.000	-
DTA × IQ	0.165	0.036	4.583	0.000	-
DTA × UA	0.168	0.033	5.091	0.000	-
IQ × UA	0.045	0.028	1.607	0.108	-
DTA × IQ × UA	0.025	0.029	0.875	0.382	Fail to Reject H_{04}

Source: SPSS Output, 2026.

The three-way interaction term (DTA × IQ × UA) is not significant (β = 0.025, t = 0.875, p = 0.382). This indicates that the joint moderating effects of institutional quality and user acceptance do not significantly affect the relationship between digital tax administration and revenue assurance. Therefore, H_{04} is not rejected.

Qualitative Findings
Interviews with tax administrators corroborated the quantitative findings, revealing three key themes related to institutional quality. First, the legal framework was seen as foundational yet challenging. One administrator noted: *"The new tax laws provide a solid legal framework, but implementation remains a challenge"* (Administrator 1, NRS). Second, administrative capacity emerged as a concern, with another respondent observing: *"Coordination between federal and state authorities has improved, but there is room for further collaboration"* (Administrator 3, SIRS). Third, governance improvements were acknowledged: *"Digital systems have reduced opportunities for corruption and collusion"* (Administrator 3, SIRS).

Regarding user acceptance, perceived usefulness drove adoption: *"Taxpayers who see the benefits are more willing to adopt"* (Administrator 5, NRS). Perceived ease of use was equally critical: *"User-friendly platforms and adequate support are essential for increasing*

adoption" (Administrator 2, SIRS). Finally, continuous training was emphasised: *"Ongoing training for staff and taxpayers is vital for successful implementation"* (Administrator 4, SIRS). These insights reinforce that institutional quality and user acceptance are critical determinants of effective digital tax administration.

Discussion

The significant positive effect of DTA on RA ($\beta = 0.278$, $p < 0.001$) aligns with prior studies (Ali & Makoni, 2026; Odiasi, 2026; Dagunduro et al., 2025), confirming that investments in digital tax infrastructure contribute meaningfully to revenue assurance. The five dimensions of DTA collectively strengthen the completeness, accuracy, collection efficiency, leakage reduction, reconciliation, and fraud detection capabilities of Nigeria's tax administration.

The significant moderating effect of institutional quality ($\beta = 0.168$, $p < 0.001$) is consistent with Ali and Makoni (2026) and the IMF (2023), emphasising that digital technology alone does not guarantee revenue gains without complementary legal reforms and institutional capacity. Simple slope analysis reveals that DTA's effect on RA is substantially stronger when institutional quality is high ($\beta = 0.355$) compared to when it is low ($\beta = 0.215$), suggesting that digital tax administration thrives in environments with strong legal frameworks, administrative capacity, governance, and coordination mechanisms. The moderating role of institutional quality can be explained by four factors: robust legal frameworks define rights and obligations (Scott, 2001); strong administrative capacity equips tax authorities with necessary skills (IMF, 2023); good governance ensures transparent use of digital systems (Ali & Makoni, 2026); and effective inter-agency coordination enables seamless data integration (Mas'ud, Mohammed & Gimba, 2023). Tax administrators corroborated these findings while noting persistent implementation challenges such as limited digital literacy, system downtime, and inadequate infrastructure despite the strong legal foundation provided by the 2025 tax reform package (NALTF, 2026).

The significant moderating effect of user acceptance ($\beta = 0.172$, $p < 0.001$) supports the Technology Acceptance Model (Davis, 1989), consistent with Inegbedion (2025) and Sukasih, Astawa, and Susanti (2025), who found that perceived usefulness, ease of use, and trust significantly influence compliance. Simple slope analysis shows that DTA's effect on RA is stronger when user acceptance is high ($\beta = 0.338$) compared to when it is low ($\beta = 0.198$), indicating that taxpayers who perceive digital systems as useful and easy to use are more likely to adopt them and comply. User acceptance enhances revenue assurance by driving adoption and consistent usage (Davis, 1989), reducing administrative burden through self-service (Venkatesh et al., 2003), and improving data quality and accuracy (Inegbedion, 2025). Tax administrators emphasised that perceived usefulness, ease of use, and continuous training are critical, with the Rev360 platform representing progress (Vanguard, 2026), though ongoing improvement and communication remain essential.

The non-significant joint moderating effect ($\beta = 0.025$, $t = 0.875$, $p = 0.382$) suggests that institutional quality and user acceptance operate through independent mechanisms rather than interactively. One explanation is that IQ influences macro-level implementation while UA affects micro-level adoption, operating in parallel. Another possibility is insufficient power to detect a three-way interaction, which are notoriously difficult to identify (Hayes, 2018). This implies policymakers should strengthen both IQ and UA independently rather than expecting

synergistic benefits, while future research continues exploring conditions under which joint moderating effects might emerge.

5.0 Summary, Conclusion and Recommendations

This study examined the moderating effects of institutional strength and technological adoption on the DTA-RA relationship in Nigeria. The findings reveal that DTA significantly affects RA ($\beta = 0.278$, $p < 0.001$), leading to rejection of H_{01}. Institutional quality significantly moderates the relationship ($\beta = 0.168$, $p < 0.001$), rejecting H_{02}. User acceptance also significantly moderates the relationship ($\beta = 0.172$, $p < 0.001$), rejecting H_{03}. However, the joint moderating effect of IQ and UA was not significant ($\beta = 0.025$, $p = 0.382$), meaning H_{04} is not rejected.

H_{01} is rejected, confirming that digital tax administration significantly enhances revenue assurance in Nigeria. The five dimensions of DTA collectively strengthen the revenue chain from capture to reporting, validating the transformative potential of digitalisation for tax administration. H_{02} is rejected, establishing that institutional quality significantly moderates the DTA-RA relationship. Digital tax administration is more effective when legal frameworks, administrative capacity, governance, and coordination are strong, supporting institutional theory and reinforcing that technology alone is insufficient without robust institutional support. H_{03} is rejected, confirming that user acceptance significantly moderates the relationship. Digital tax administration is more effective when taxpayers perceive systems as useful and easy to use, supporting the Technology Acceptance Model and highlighting that adoption is fundamentally a behavioural, not merely technical, challenge. H_{04} is not rejected, as joint moderation was not significant, suggesting that IQ and UA operate through independent mechanisms rather than interactive effects, indicating that policymakers should strengthen both factors independently rather than expecting synergistic benefits.

Recommendations

For the direct effect (H_{01}), the NRS should continue investing in all five DTA dimensions and prioritise full implementation and continuous improvement of the Rev360 platform. For institutional quality (H_{02}), the government should strengthen legal and regulatory frameworks, build administrative capacity through training and resources, improve inter-agency coordination for data integration, and enhance governance and accountability mechanisms. For user acceptance (H_{03}), the NRS should invest in taxpayer education and digital literacy, design user-friendly platforms, provide continuous training and support, and effectively communicate the benefits of digital systems. For joint moderating effects (H_{04}), policymakers should adopt a dual-pronged strategy strengthening IQ and UA independently and regularly monitor both factors as independent drivers of effectiveness.

Future research should employ longitudinal designs to establish causality, conduct comparative studies across Nigerian states and West African countries, examine mediating mechanisms such as transaction completeness and leakage reduction, continue exploring conditions for joint moderating effects with larger samples, and conduct sector-specific studies in the informal sector, digital economy, and financial services.

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