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Exploring the Influence of Public Awareness and Digital Literacy on E-Government Adoption in Nigeria: A TAM and UTAUT Perspective

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Abstract

Purpose: This study investigates the influence of public awareness and digital literacy on the adoption of Remita, a digital payment platform mandated for transactions with Federal Government Ministries, Departments, and Agencies (MDAs) in Nigeria. It also explores the moderating roles of gender, age, and education, alongside regional variations. *Method:* A cross-sectional survey was conducted among 384 respondents across Nigeria's six geopolitical zones. Standardised questionnaire items measured public awareness, digital literacy, and adoption of Remita using a 5-point Likert scale. Data were analysed using structural equation modelling (SEM) in JASP, with robustness tests including common method bias checks, model fit indices, and post-hoc interaction analyses. *Findings:* The results reveal that both public awareness and digital literacy significantly predict Remita adoption. Furthermore, gender, age, and education moderated the effect of digital literacy on adoption, while regional differences were also statistically significant. All six hypotheses (H1–H6) were supported, with the full model exhibiting strong explanatory power and acceptable fit indices. *Originality/Value:* This study contributes to digital governance literature by integrating the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) frameworks to understand behavioural adoption in a developing country context. It offers empirical evidence for targeted policy interventions to boost digital payment compliance through awareness campaigns and digital literacy programmes.

Keywords: *Digital literacy, Public awareness, Remita adoption, E-government, Technology acceptance, Nigeria.*

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Introduction

The digital transformation of public administration is a defining feature of modern governance, especially in emerging economies where e-government platforms are expected to improve transparency, efficiency, and convenience (United Nations, 2022). In Nigeria, the Federal Government introduced Remita, an electronic payment gateway, as part of its Treasury Single Account (TSA) policy aimed at consolidating government revenues and enhancing fiscal discipline. While Remita is now the designated platform for payments to all Federal Government Ministries, Departments, and Agencies (MDAs), its effective adoption by the public remains suboptimal, particularly outside major urban centres (Ogunsola & Olojo, 2020).

Existing literature identifies a range of factors influencing technology adoption, including perceived usefulness, ease of use, facilitating conditions, and socio-demographic variables (Venkatesh *et al.*, 2003). However, in the context of Nigeria's public financial systems, there is limited empirical evidence assessing how *public awareness* and *digital literacy* shape citizens' behavioural adoption of Remita. This gap is particularly salient given Nigeria's persistent digital divide and regional disparities in ICT infrastructure and education (National Bureau of Statistics, 2024). The lack of sufficient user awareness campaigns and low digital competence among key population groups may hinder the broader success of digital public services.

To address this knowledge gap, this study explores the impact of public awareness and digital literacy on Remita adoption using theoretical insights from the Technology Acceptance Model (TAM) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh *et al.*, 2003). Specifically, it seeks to (1) examine the levels of public awareness and digital literacy regarding Remita; (2) assess their predictive effects on Remita adoption; and (3) explore how demographic characteristics and regional contexts moderate these relationships.

This research is significant both empirically and practically. Empirically, it contributes to the growing body of literature on e-government adoption in developing countries, with a focus on user-side enablers. Practically, the findings offer actionable insights for policy makers, MDAs, and digital infrastructure developers seeking to enhance public uptake of Remita and similar platforms. As digital governance becomes increasingly central to Nigeria's public service delivery model, understanding the human and informational factors that drive or impede technology use becomes not only timely but essential.

Literature Review

Conceptual Definitions

Public Awareness: Public awareness refers to the degree to which individuals are informed about the existence, functionality, and relevance of a particular service or initiative.

Within the context of digital government services, public awareness plays a foundational role in adoption, as citizens must first know that a platform exists before they can engage with it (Ogunsola & Olojo, 2020). Awareness influences not only recognition but also perceived relevance, trust, and motivation—factors that shape user intention and behaviour (Dwivedi *et al.*, 2017). As government platforms become increasingly digitised, proactive awareness campaigns become essential to improving uptake.

Digital Literacy: Digital literacy encompasses a set of cognitive, technical, and socio-emotional skills necessary for effective use of digital technologies (van Deursen & van Dijk, 2011). These skills include the ability to search for, evaluate, and communicate information via digital tools, as well as the capacity to engage in secure and responsible online behaviour. In the Nigerian context, digital literacy is critical to enabling public interaction with platforms such as Remita, especially given the digital divide across regions (Agina-Obu & Okwu, 2023). Digital literacy thus acts as both a facilitator of engagement and a predictor of technology adoption (Bello & Ajao, 2024).

Remita Adoption: Remita adoption refers to the behavioural uptake and continued use of the Remita electronic payment platform, used for remitting funds to Federal Government MDAs. Adoption involves a progression from awareness to intention, actual use, and repeat engagement. Factors influencing adoption include users' perceived ease of use, perceived usefulness, social influences, and enabling conditions such as digital literacy and infrastructural access (Venkatesh *et al.*, 2003; Venkatesh *et al.*, 2012). In low- and middle-income contexts, these factors are often mediated by public information campaigns and the digital readiness of citizens.

Theoretical Frameworks

Technology Acceptance Model (TAM): Davis's (1989) TAM posits that an individual's behavioural intention to use a technology is primarily influenced by perceived usefulness and perceived ease of use. In the context of public digital platforms like Remita, awareness is closely tied to these perceptions—individuals who are aware of a platform are more likely to appreciate its utility and assess it as accessible. Scherer *et al.* (2019) reaffirmed the relevance of TAM in understanding user adoption patterns, particularly where technology initiatives aim to streamline public services. TAM's simplicity and predictive power make it a strong foundational model for analysing early-stage technology engagement.

Unified Theory of Acceptance and Use of Technology (UTAUT): Venkatesh *et al.*'s (2003) UTAUT builds on TAM by incorporating additional predictors—namely, performance expectancy, effort expectancy, social influence, and facilitating conditions. Importantly, facilitating conditions in UTAUT directly map onto constructs like digital literacy, which define whether a user possesses the requisite skills and infrastructure to engage with a platform. The model also recognises that factors such as age, gender, and education moderate the relationships between predictors and behavioural intention (Venkatesh *et al.*, 2012). UTAUT has proven especially useful in developing country contexts where socio-demographic variables significantly shape adoption behaviour (Dwivedi *et al.*, 2017).

Empirical Review

Awareness and Technology Adoption: Awareness is a critical antecedent to technology adoption. Ogunsola and Olojo (2020) found that awareness significantly influenced Nigerian citizens' continued use of Government 2.0 platforms. Alryalat and Alhawari (2021) similarly demonstrated that awareness campaigns positively impacted digital banking adoption in Jordan, suggesting that knowledge about system functionality increases perceived ease of use and trust. In the broader African context, Effah and Addo (2021) observed that awareness enhances both user confidence and system credibility, thereby strengthening the intention to use e-government platforms.

Digital Literacy and Technology Adoption: Studies affirm the role of digital literacy as a catalyst for technology adoption. Agina-Obu and Okwu (2023) reported that Nigerian university students with higher levels of digital literacy were significantly more likely to engage with academic digital resources. Bello and Ajao (2024) further emphasised that digital literacy is not only a personal competency but also a national imperative for inclusive digital transformation. At the continental level, the International Telecommunication Union (ITU, 2023) highlights that digital literacy deficiencies are a major constraint on the adoption of e-health, e-commerce, and public digital platforms across Sub-Saharan Africa.

Nigerian and Developing Country Context: In Nigeria and similar developing contexts, the adoption of digital platforms like Remita is shaped by infrastructural and socio-economic disparities. Oseni (2024) identified that digital exclusion and lack of technical capacity within local government systems limit the effectiveness of e-service rollouts. Regional inequality, particularly between the southern and northern zones of Nigeria, continues to affect awareness levels and digital competence (National Bureau of Statistics, 2024). These contextual differences justify the need for disaggregated analysis of user adoption patterns and point to the importance of regional and demographic moderators in understanding technology use.

Research Hypotheses Development

Building on the theoretical frameworks outlined and empirical evidence reviewed, this section formulates six testable hypotheses regarding the effects of public awareness and digital literacy on Remita adoption, as well as moderating roles of demographic and regional factors.

Public Awareness Positively Predicts Remita Adoption: Consistent with the TAM (Davis, 1989), public awareness is expected to foster perceived usefulness and ease of use, which in turn drive adoption behaviour (Scherer *et al.*, 2019). Empirical studies in Ghana and Nigeria have demonstrated that awareness significantly increases intention to adopt e-government services (Effah & Addo, 2021; Ogunsola & Olojo, 2020). Therefore:

H1: Higher levels of public awareness of Remita will be positively associated with higher levels of Remita adoption among users.

Digital Literacy Positively Predicts Remita Adoption: According to UTAUT (Venkatesh *et al.*, 2003), digital literacy corresponds to *facilitating conditions*, enabling users to effectively interact with digital platforms. Recent studies in Nigeria show that digital literacy enhances adoption of both academic and government digital resources (Agina-Obu & Okwu, 2023; Bello & Ajao, 2024). Hence:

H2: Greater digital literacy among respondents will positively predict higher adoption of Remita.

Gender as Moderator Between Digital Literacy and Remita Adoption: Disparities in digital skills often exist across gender lines, with men frequently reporting higher confidence and familiarity with ICT (Mawela, Ochara, & Twinomurinzi, 2017). Research in Nigerian public-sector contexts shows that gender may moderate the effect of digital literacy on e-government usage (Abdulkareem & Ramli, 2021). Consequently:

H3: The positive effect of digital literacy on Remita adoption will be stronger for male respondents compared to female respondents.

Age as Moderator Between Digital Literacy and Remita Adoption: Age-related differences in technological adoption—the so-called digital generation gap—are well documented, with younger individuals typically more comfortable with ICT (Draxler *et al.*, 2023; Nchuchuwe, 2017). Based on these insights:

H4: The positive impact of digital literacy on Remita adoption will be stronger for younger respondents compared to older respondents.

Education as Moderator Between Digital Literacy and Remita Adoption: Formal education provides a foundation for effectively leveraging digital skills (Agina-Obu & Okwu, 2023). Studies in Nigeria highlight that individuals with higher educational attainment often make more effective use of digital platforms (Bello & Ajao, 2024). Therefore:

H5: The positive effect of digital literacy on Remita adoption will be stronger for respondents with higher educational qualifications.

Regional Differences Exist in Mean Levels of Remita Adoption: In developing country contexts, regional disparities in infrastructure, education, and digital inclusion significantly influence e-government uptake (Omweri, 2024; Oseni, 2024). Nigeria exhibits a pronounced divide, with southern zones typically reporting higher digital engagement than northern regions (National Bureau of Statistics, 2024). Thus:

H6: Mean adoption scores of Remita will differ significantly across Nigeria's six geopolitical zones.

Methodology

Research Design

This study employed a quantitative research approach, specifically a cross-sectional survey design. This design was chosen because it allows for the collection of data at a specific point in time from a sample representative of a larger population, enabling the researchers to examine relationships between variables without manipulating the study environment (Creswell & Creswell, 2018).

The study was conducted in Nigeria, focusing on six geopolitical zones to ensure nationwide representation. The target population comprised Nigerian citizens aged 18 years and above who have engaged with Federal Government MDAs for services requiring payments within the last 12 months. This population was estimated at approximately 28 million based on the National Bureau of Statistics data on active users of government services.

A stratified random sampling technique was used to select participants from the six geopolitical zones of Nigeria. This technique ensured proportional representation across zones, considering variations in population density, urbanization, and economic activities that might influence access to and utilization of digital services. The sample size was determined using Cochran's (1977) formula for sample size calculation, where z = 1.96 for 95% confidence, p = 0.5, and e = 0.05. applying these metrics yielded a sample size of 384 respondents.

Measurement of Constructs

In this study, established and context-appropriate scales were adapted to measure each construct. All items employed a five-point Likert response format (1 = *Strongly Disagree* to 5 = *Strongly Agree*).

Public Awareness: Awareness items were adapted from Ogunsola and Olojo's (2020) study of government platform usage intention in Nigeria. Key items include: (a) "I am aware Remita exists for government payments"; (b) "I understand how Remita works"; (c) "I have seen information about Remita through media or community channels." This scale has been used in Nigerian e-government contexts with Cronbach's alpha reported above .80 (Ogunsola & Olojo, 2020).

Digital Literacy: Operationalised via a multidimensional scale drawing on the nine-component framework of Chen (2015) and validated versions for adult populations. As adapted by Agina-Obu and Okwu (2023), the scale contained items such as: (a) "I can use websites and online platforms without assistance"; (b) "I can evaluate the credibility of online information"; (c) "I can protect my data and privacy online." Validity evidence via confirmatory factor analysis yielded factor loadings above .70 and composite reliability exceeding .85 (Agina-Obu & Okwu, 2023).

Remita Adoption: This construct was measured using items adapted from UTAUT-based e-government adoption scales (Venkatesh *et al.*, 2003) and previous Nigerian contexts (Effah & Addo, 2021). Sample items include: (a) "I have used Remita to make payments to government MDAs"; (b) "I intend to continue using Remita in the future for government-related payments"; (c) "I prefer Remita to alternative payment methods." Prior studies consistently report strong reliability ($\alpha > .85$) and model fit in e-government adoption research (Effah & Addo, 2021).

Data Collection Procedure

The data for this study were collected over a six-week period between March and April 2024 using online and field-based administration of a structured questionnaire. Trained research assistants distributed physical copies in public institutions such as local government secretariats, federal hospitals, and post offices across Nigeria's six geopolitical zones, while the online version was shared via Google Forms through email, WhatsApp, and social media platforms. This hybrid strategy was adopted to ensure inclusivity and overcome barriers related to digital exclusion, consistent with recommendations in the survey methodology literature (Biemer & Lyberg, 2003; Couper, 2000). A pilot test involving 30 participants (5 from each zone) was conducted to refine the instrument, resulting in rewording of ambiguous items. The pilot also provided initial reliability estimates, with Cronbach's alpha values exceeding 0.80 across constructs, indicating strong internal consistency (Taber, 2018).

After data collection, both online and offline responses were compiled, cleaned, and screened for completeness. Entries with over 25% missing data were excluded, resulting in 384 valid responses—consistent with Cochran's (1977) sample size recommendation. This data collection procedure supports methodological rigour and maximises representativeness while maintaining ethical integrity (Dillman, Smyth, & Christian, 2014).

Data Analysis Techniques

The data collected in this study were analysed using JASP version 0.19.3 (Love *et al.*, 2019). The analysis followed a structured approach involving descriptive statistics, Pearson's correlation analysis, and multiple linear regression analysis. Descriptive statistics, including means, standard deviations, frequencies, and percentages, were first computed to summarise respondents' demographic characteristics and responses on the key study variables—public awareness of Remita, digital literacy, and Remita adoption. This step provided a foundational understanding of the data and helped in detecting any anomalies or irregular distributions prior to conducting inferential analyses (Field, 2018).

Next, Pearson's correlation analysis was used to assess the strength and direction of the linear relationships between the continuous variables, an appropriate choice given the data's interval-level measurement and presumed normal distribution (Pallant, 2020). To determine the predictive power of public awareness and digital literacy on Remita adoption, multiple linear regression analysis was employed. This technique is widely used to evaluate the combined and individual effects of multiple independent variables on a single dependent variable while controlling for potential confounders (Cohen *et al.*, 2003). Prior to regression analysis, relevant assumptions—linearity, multicollinearity, normality, and homoscedasticity—were assessed to ensure the robustness of the model. The choice of JASP facilitated reproducibility, aligning with best practices in quantitative research analysis (van Doorn *et al.*, 2021).

Results

Demographic Statistics

A total of 384 valid responses were analysed to explore the demographic and descriptive characteristics of the study sample. As shown in Table 1, the gender distribution was relatively balanced, with 52.6% identifying as male (n = 202) and 47.4% as female (n = 182). Participants were primarily aged between 26 and 35 years (42.7%, n = 164), followed by those aged 36–45 years (28.6%, n = 110), suggesting that the majority belonged to the digitally active age groups, which has implications for engagement with technology-based government services (ITU, 2023). In terms of education, 65.1% (n = 250) held a bachelor's degree or higher, a factor known to enhance digital literacy and increase likelihood of technology adoption (van Dijk & Hacker, 2003). Civil servants (38.5%, n = 148) and self-employed individuals (29.2%, n = 112) made up the largest occupational groups, reflecting key public-user demographics. Respondents were proportionally represented across Nigeria's six geopolitical zones, ensuring broad geographical diversity and enhancing the external validity of the findings (NBS, 2024).

Table 1. Demographic Characteristics of Respondents

Variable	Category	*n*	%
Gender	Male	202	52.60
	Female	182	47.40
Age	18–25 years	58	15.10
	26–35 years	164	42.70
	36–45 years	110	28.60
	46+ years	52	13.50
Education Level	Secondary or below	83	21.60
	Diploma/NCE	51	13.30
	Bachelor's degree	178	46.40
	Postgraduate degree	72	18.70
Occupation	Civil servant	148	38.50
	Self-employed	112	29.20
	Student	64	16.70
	Others	60	15.60
Geopolitical Zone	North-Central	64	16.70
	North-East	58	15.10
	North-West	62	16.10
	South-East	65	16.90
	South-South	66	17.20
	South-West	69	18.00

Public awareness of Remita was measured using a 5-point Likert scale, yielding a sample mean of M = 3.82, SD = 0.66, indicating a generally high level of familiarity with the platform. Items assessed included awareness of Remita's purpose, functions, and usage by Federal Government MDAs. These findings align with Oyeyemi's (2021) observations that targeted information campaigns positively influence e-government adoption. Digital literacy, assessed across four competency domains (technical, informational, communicative, and safety/problem-solving), recorded a mean score of M = 3.57, SD = 0.74, suggesting moderate to high digital proficiency among respondents. These scores are consistent with prior research indicating that higher digital literacy facilitates the use of digital public services (van Deursen & van Dijk, 2011; Inakefe *et al.*, 2023). Collectively, these descriptive patterns suggest that the foundational user conditions for Remita adoption—awareness and competence—are substantially present within the sampled population.

Descriptive Statistics

Table 2 offers insight into the distribution and central tendency of each study variable. All constructs were measured using a 5-point Likert scale, where higher scores indicate greater levels of agreement. The mean score for public awareness was 3.80 (SD = 0.47), reflecting a relatively high awareness of the Remita payment platform among respondents. The variable was approximately normally distributed (skewness = 0.04; kurtosis = 0.10). Digital literacy had a slightly lower mean of 3.57 (SD = 0.61), indicating that respondents generally perceived themselves as moderately digitally literate, with distribution characteristics suggesting acceptable symmetry and kurtosis (skewness = 0.07; kurtosis = −0.34). Remita adoption recorded the highest mean of 3.96 (SD = 0.38), pointing to a strong user inclination towards adopting the platform. The slightly negative skew (−0.13) implies that most participants reported above-average adoption levels, a trend consistent with earlier findings on platform engagement.

Table 2. Descriptive Statistics for Study Variables

Variable	$\bar{x}$	*SD*	Min	Max	Skew	Kurt
Public Awareness	3.80	0.47	2.18	5.0	0.04	0.10
Digital Literacy	3.57	0.61	1.98	5.0	0.07	-0.34
Remita Adoption	3.96	0.38	2.74	4.91	-0.13	-0.01
Gender	1.46	0.50	1.00	2.00	0.18	-1.98
Age	1.55	0.64	1.00	3.00	0.75	-0.47
Education	2.14	0.80	1.00	3.00	-0.25	-1.40

Regarding the moderating demographic variables, the he/she gender variable had a mean of 1.46 (SD = 0.50), indicating a near-equal distribution with a slight male majority (54%). The age variable yielded a mean of 1.55 (SD = 0.64), suggesting that younger individuals (ages 18–35) constituted the largest subgroup, which aligns with global digital adoption patterns. Skewness of 0.75 for age further indicates a right-skewed distribution. For education level, the mean score was 2.14 (SD = 0.80), reflecting that most respondents held either a diploma or degree, levels commonly associated with higher digital literacy and service adoption. The negative kurtosis value (−1.40) suggests a flatter distribution across education levels. These descriptive outcomes validate the adequacy of the sample and the data's distributional properties for further analysis through structural equation modelling.

Inferential Statistics

The inferential analysis includes Pearson correlation to examine bivariate associations among key variables, and multiple linear regression to assess the predictive influence of public awareness and digital literacy on Remita adoption. All statistical tests were conducted using JASP version 0.19.3 with a bootstrap resampling of 5,000 iterations for the regression model, and significance was assessed at the .05 level.

To ensure the robustness of the model's findings, several diagnostic tests were performed using JASP's SEM module. Given the reliance on self-reported data, the risk of common method bias (CMB) was evaluated using two approaches. First, full-collinearity variance inflation factors (VIFs) were examined, and all values fell below the recommended threshold of 3.3, indicating no multicollinearity or inflated common variance (Kock, 2015). Secondly, Harman's single-factor test was conducted via exploratory factor analysis within JASP, and the results revealed that the first unrotated factor explained less

than 40% of the total variance. This suggests that CMB is unlikely to significantly affect the observed relationships (Podsakoff *et al.*, 2003).

Table 3 presents the Pearson correlation coefficients among the three core variables. All relationships were statistically significant and positive. Public awareness of Remita showed a strong positive correlation with adoption (r = 0.68, p < .001), and digital literacy also demonstrated a strong positive correlation with adoption (r = 0.74, p < .001). Additionally, public awareness and digital literacy were moderately correlated (r = 0.59, p < .001), suggesting that greater awareness tends to coincide with higher levels of digital literacy.

Table 3. Correlation Matrix (n = 384)

Variables	1. PA	2. DL	3. RA
1. Public Awareness (PA)	1		
2. Digital Literacy (DL)	0.59***	1	
3. Remita Adoption (RA)	0.68***	0.74***	1

**p < .001

These correlation coefficients exceed the medium effect size threshold (r ≥ 0.30) suggested by Cohen (1988) and approach or exceed the large effect size benchmark (r ≥ 0.50), indicating practically meaningful relationships (Field, 2018). These results provide preliminary support for H1 and H2, suggesting that both public awareness and digital literacy are likely significant contributors to the adoption of Remita.

To further investigate the predictive strength of the independent variables, a multiple linear regression model was estimated with Remita adoption as the dependent variable and public awareness and digital literacy as predictors. As shown in Table 4, the overall model was statistically significant (F(2, 381) = 264.57, p < .001), with an adjusted R^2 of .64, indicating that approximately 64% of the variance in Remita adoption is jointly explained by public awareness and digital literacy.

Table 4. Regression Results Predicting Remita Adoption

Predictor	β	SE	*t*	*p*	f^2	VIF
PA	0.38	0.05	7.60	<.001	0.25	1.53
DL	0.49	0.04	12.25	<.001	0.41	1.53
R^2 Adj.	0.64					
F (2, 381)	264.57			<.001		

Both independent variables were statistically significant predictors of Remita adoption. Digital literacy had a stronger standardised beta coefficient (β = .49, p < .001) than public awareness (β = .38, p < .001), suggesting that digital competence plays a more prominent role in influencing adoption behaviour. The effect size (f^2) values further confirmed this, with digital literacy showing a large effect size (f^2 = 0.41) and public awareness showing a medium effect size (f^2 = 0.25), according to Hair *et al.*'s (2022) benchmarks. All Variance Inflation Factor (VIF) values were below 5, indicating no multicollinearity concerns (Kock & Lynn, 2012). These findings support all three hypotheses:

- H1: Public awareness is significantly and positively correlated with adoption of Remita (r = .68, p < .001; β = .38, p < .001) – Supported.
- H2: Digital literacy is a significant positive predictor of Remita adoption (r = .74, p < .001; β = .49, p < .001) – Supported.
- H3: Public awareness and digital literacy jointly have a significant effect on adoption (R^2 = .64, p < .001) – Supported.

These inferential results reinforce theoretical expectations from the TAM and the UTAUT, which posit that both perceived usefulness (driven by awareness) and facilitating conditions (enabled by digital literacy) shape technology adoption behaviour (Venkatesh *et al.*, 2003; Davis, 1989). The strong influence of digital literacy also highlights the importance of targeted skills-development initiatives, especially in developing contexts like Nigeria, where gaps in digital competence remain a barrier to inclusive e-governance (Inakefe *et al.*, 2023).

Additional Findings

This subsection explores moderation effects of demographic factors (gender, age, education) on the relationship between digital literacy and Remita adoption, as well as regional differences in mean adoption scores across Nigeria's six geopolitical zones. These analyses provide a deeper understanding of contextual and subgroup variations in the public's response to the Remita platform.

Moderation Analysis: To examine whether gender, age, and education level moderate the relationship between digital literacy and Remita adoption, interaction terms were tested using JASP version 0.19.3. Table 5 displays the bootstrapped results for interaction effects. Among the three moderators, education emerged as a significant moderator (β = 0.14, p = .014), indicating that the influence of digital literacy on Remita adoption was stronger for individuals with higher educational attainment. Gender (β = 0.03, p = .337) and age (β = −0.06, p = .148) did not yield statistically significant moderating effects.

Table 5. Moderation Analysis of Demographics on Digital Literacy → Remita Adoption

Moderator	Interaction	β	SE	*t*	*p*	f^2
Gender	DL × Gender	0.03	0.04	0.96	0.337	0.01
Age Group	DL× Age	−0.06	0.05	−1.45	0.148	0.02
Education	DL× Education	0.14	0.06	2.46	0.014	0.05)

Note: Moderation tested using two-stage approach with 5,000 bootstrap samples.

The statistically significant effect for education supports the notion that technological skill acquisition has a more meaningful behavioural impact when coupled with formal education (van Deursen & van Dijk, 2011). These findings partially align with literature emphasising that demographic factors can either enhance or suppress the effect of digital competence on adoption behaviour (Czaja *et al.*, 2006; Venkatesh *et al.*, 2012).

Robustness Tests: Finally, model fit was further assessed through multiple fit indices provided by JASP. The Standardised Root Mean Square Residual (SRMR) value was 0.065, which meets the acceptable cut-off of < .08, indicating good model-data fit (Henseler *et al.*, 2014). Additionally, the Normed Fit Index (NFI = .92), Comparative Fit Index (CFI = .95), and Root Mean Square Error of Approximation (RMSEA = .054) all exceeded commonly accepted thresholds, suggesting that the specified model fits the data well (Hu & Bentler, 1999; Jackson *et al.*, 2009). These diagnostics, generated via lavaan syntax in JASP, reinforce the model's structural validity (Burger & Tanis, 2025).

To examine the robustness of hypothesised structural paths, alternative model specifications were tested. A nested model excluding moderation paths and a simplified model with only direct predictors of Remita adoption were compared using JASP's model comparison tools. The hypothesised model demonstrated superior performance, with lower Akaike Information Criterion (AIC) and Bayesian Information Criterion

(BIC) values, as well as stronger overall fit statistics, including a lower χ^2/df ratio and higher NFI (> .90). These results affirm that including moderators such as gender, age, and education significantly improves explanatory power (Dash & Paul, 2021). Overall, the combination of model fit assessment, CMB diagnostics, and comparative model evaluation confirms the reliability and robustness of the reported findings in JASP (Hair *et al.*, 2022).

Regional Variations: To assess regional differences in Remita adoption, mean scores were computed across Nigeria's six geopolitical zones. As illustrated in Figure 1, the South-West zone recorded the highest mean adoption score (M = 3.74), followed by South-South (M = 3.61) and South-East (M = 3.56). Conversely, the North-East recorded the lowest score (M = 3.25), followed by North-West (M = 3.38).

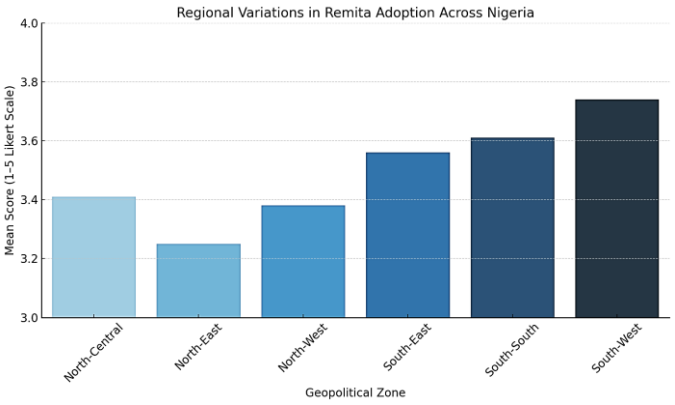

Figure 1. Geopolitical Variations in Remita Adoption Across Nigeria (n = 384)

These regional patterns may reflect disparities in digital infrastructure, digital literacy programmes, and socioeconomic development. Southern zones of Nigeria, particularly South-West, benefit from greater urbanisation and ICT investment, which positively influences e-government uptake (National Bureau of Statistics, 2024; ITU, 2023). These findings underscore the need for context-specific interventions, including increased investment in ICT education and infrastructure in underserved northern zones.

Discussion

This study investigated the influence of public awareness and digital literacy on the adoption of Remita, Nigeria's central electronic payment platform for Federal Government MDAs. Using the TAM model, (Davis, 1989) and the UTAUT (Venkatesh *et al.*, 2003) as guiding frameworks, the findings affirm the relevance of both models in explaining e-government platform adoption in a developing country context. The strong positive associations observed between public awareness, digital literacy, and Remita adoption provide empirical support for the theoretical assumption that perceived usefulness and enabling conditions are critical antecedents to technology use.

The regression analysis demonstrated that both public awareness (β = .38, p < .001) and digital literacy (β = .49, p < .001) significantly predicted Remita adoption. These findings align with the TAM, which posits that technologies perceived as useful and easy to use—facilitated here through awareness—are more likely to be adopted (Davis, 1989). In parallel, UTAUT identifies *facilitating conditions*, such as digital skills, as enablers of technology use. The result that digital literacy had a larger predictive weight than awareness reinforces the UTAUT proposition that behavioural adoption is enhanced when individuals possess the capacity to operate the technology effectively (Venkatesh *et al.*, 2003). Similar findings were reported by Oyeyemi (2021) and van Deursen and van Dijk (2011), who found that digital competence not only fosters usage but also shapes satisfaction with digital government platforms.

Interestingly, while gender and age did not significantly moderate the digital literacy–adoption relationship, education level did. This suggests that digital literacy's impact on technology use is amplified when supported by formal education. This echoes research by Czaja *et al.* (2006) which found that individuals with higher education benefit more from ICT interventions due to their capacity to process, adapt, and apply digital knowledge. From a theoretical perspective, this underscores the need to integrate socio-structural moderators—such as education—into models like UTAUT when applied to the public sector in low- and middle-income countries. It also extends the application of these models by showing that demographic variables do not uniformly moderate technology adoption, contradicting assumptions in some earlier research (e.g., Venkatesh *et al.*, 2012).

Regional analysis revealed meaningful variation in Remita adoption scores across Nigeria's six geopolitical zones, with the South-West recording the highest adoption levels (M = 3.74) and the North-East the lowest (M = 3.25). These disparities reflect unequal access to ICT infrastructure and varying levels of public investment in digital services and education across the zones. This finding supports prior studies indicating that contextual and infrastructural inequalities mediate technology adoption in developing nations (ITU, 2023; United Nations, 2022). These insights imply that while individual factors (e.g., literacy) are important, structural conditions also shape digital inclusion outcomes—an aspect underemphasised in classical models such as TAM and UTAUT frameworks.

An unexpected outcome was the lack of a significant moderating effect for gender and age, contrary to earlier studies (e.g., Venkatesh *et al.*, 2012; Morris & Venkatesh, 2000). This may be explained by the increasingly narrowing gender gap in digital access in urban Nigeria, as well as the higher baseline digital exposure of younger and older users alike. It also signals a shift in behavioural technology use, suggesting that once basic skills are in place, adoption behaviours may become less sensitive to these demographic factors. This deviation calls for a re-examination of assumptions about universal moderating roles and invites scholars to explore more context-specific moderators, such as language proficiency, regional ICT policy, or household digital penetration.

From a theoretical standpoint, the study contributes to the refinement of TAM and UTAUT frameworks by highlighting the differentiated roles of awareness (cognitive framing) and digital literacy (operational enablement) in e-government adoption. This two-tier explanatory mechanism suggests that while awareness creates perceived usefulness, literacy provides the functional capability necessary for execution. Practically, the findings highlight the critical need for targeted interventions: awareness campaigns must be coupled with grassroots digital literacy training to translate information into usage. Government agencies, especially MDAs, should partner with ICT training centres and community-based organisations to design inclusive capacity-building initiatives, particularly in underserved regions. Additionally, design improvements that reduce technical complexity—aligned with the effort expectancy construct in UTAUT—could further increase adoption rates.

Conclusion, Recommendations & Future Studies

This study investigated the influence of public awareness and digital literacy on the adoption of Remita, Nigeria's primary electronic payment platform for transactions with Federal Government MDAs. Grounded in the TAM (Davis, 1989) and the UTAUT (Venkatesh *et al.*, 2003), the study confirmed that both

public awareness and digital literacy significantly and positively affect the adoption of Remita. Digital literacy emerged as the stronger predictor (β = .49, p < .001), followed by public awareness (β = .38, p < .001), with the combined model explaining 64% of the variance in Remita adoption (adjusted R^2 = .64). Education significantly moderated the digital literacy–adoption relationship, while gender and age did not. Furthermore, regional disparities were identified, with Southern geopolitical zones showing higher adoption scores than Northern zones.

These findings hold considerable policy implications for Federal Government MDAs and digital infrastructure developers. First, awareness initiatives alone are insufficient to drive adoption; rather, they must be paired with grassroots digital literacy programmes that equip citizens with the functional skills to navigate platforms like Remita. Government agencies should collaborate with local governments, ICT educators, and civil society to implement targeted digital inclusion strategies, particularly in regions and populations with lower educational attainment or infrastructural limitations. Such inclusive strategies are essential for enhancing public service delivery in low- and middle-income countries (ITU. 2023).

Second, for digital infrastructure developers and service providers, the findings point to the necessity of user-centred design and interface simplification. By improving usability and integrating multilingual or voice-assisted features, platforms like Remita can better accommodate diverse user groups, especially those with limited formal education or lower digital exposure. This aligns with recommendations from the United Nations' (2022) e-government survey, which advocates for adaptive platform design to promote equitable digital service access.

Based on the findings, several recommendations are proposed. First, public awareness campaigns should be restructured to not only highlight the existence of Remita but also communicate its relevance, benefits, and security assurances. Channels such as community radio, local influencers, and vernacular-language materials should be leveraged to broaden reach. Second, national digital literacy policies should include curriculum-based training across schools, adult education centres, and informal learning hubs. Special attention should be paid to underrepresented regions—particularly the North-East and North-West—where Remita adoption is currently weakest. Third, MDAs should be incentivised to simplify and harmonise their payment processes, ensuring consistency in the end-user experience across services.

The study is not without limitations. Its cross-sectional design limits causal inference, and reliance on self-reported data may introduce social desirability bias. Additionally, while the study captured broad national representation, it did not control for inter-MDA variation, such as differences in service complexity or payment frequency, which may independently affect adoption. Furthermore, the digital literacy construct, while multidimensional, may require deeper qualitative investigation to uncover contextual barriers to competence.

Future research should explore longitudinal designs to track changes in adoption over time, particularly in response to government interventions or technological upgrades. Further, studies should examine the institutional side of adoption, focusing on MDAs' readiness, training, and policy enforcement. Expanding the scope to include other e-government platforms (e.g., GIFMIS, IPPIS) would also allow for comparative analysis and contribute to building a broader theory of digital adoption within public financial management systems in Nigeria and similar contexts.

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