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MULTIDIMENSIONAL DIGITAL TECHNOLOGY ADOPTION AND MSME PERFORMANCE IN NIGERIA: THE MEDIATING ROLE OF ENTREPRENEURIAL ORIENTATION AND THE MODERATING ROLE OF GOVERNMENT POLICY

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Abstract

Digital technology adoption was promoted to boost MSME performance in developing economies, yet many Nigerian MSMEs showed weak results despite increased access. This study examined the structural links between multidimensional digital adoption and MSME performance, with entrepreneurial orientation (EO) as a mediator and government policy as a moderator, in Ondo State, Nigeria. Using a cross-sectional survey of 400 registered MSME owners and PLS-SEM, findings revealed that digital marketing tools significantly enhanced EO (β=0.227), financial (β=0.144), and non-financial performance (β=0.173). FinTech adoption strongly predicted EO (β=0.662) but negatively affected financial performance directly (β=−0.257), while positively influencing it indirectly through EO (β=0.261). EO improved financial (β=0.394) and non-financial performance (β=0.502). Government policy showed direct and mixed moderating effects. The model explained substantial variance (R^2=0.621 financial; 0.575 non-financial). The study concluded that digital adoption alone did not guarantee MSME success; its value depended on EO and supportive policy.

Keywords: Digital adoption, Entrepreneurial orientation, Government policy, MSME performance, PLS-SEM, Nigeria

1. Introduction

Digital technologies have fundamentally transformed the global business landscape over the past two decades. Innovations such as mobile computing, cloud platforms, big data analytics, artificial intelligence, and financial technologies have transitioned from peripheral tools to central drivers of value creation, competitive advantage, and economic growth (Warner & Wäger, 2019; Sebastian et al., 2020; Zherlitsyn et al., 2025). In today's knowledge-driven economy, firms are increasingly evaluated not by their possession of tangible resources

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alone but by their ability to deploy digital technologies strategically to enhance efficiency, foster innovation, and respond dynamically to market changes (Bharadwaj et al., 2013; Seppänen et al., 2025).

At the heart of this digital transformation are Micro, Small, and Medium Enterprises (MSMEs), which constitute the backbone of global economies. MSMEs account for over 90 percent of businesses worldwide and contribute significantly to employment generation, innovation, and economic resilience (World Bank, 2024; Santoso et al., 2025). In developing economies, their role is even more critical, as they serve as primary engines of income generation, poverty reduction, and local economic development. However, despite their undeniable importance, MSMEs often operate under severe structural constraints, including limited access to finance, inadequate infrastructure, weak managerial capabilities, and restricted market access (Beck & Demirgüç-Kunt, 2006).

Digital technologies have created unprecedented opportunities for MSMEs to overcome these structural barriers. Through e-commerce platforms, firms can access global markets beyond their immediate geographic reach. Through digital marketing tools, they can engage customers more effectively and build brand awareness at minimal cost. Through financial technologies, they can bypass traditional banking limitations and access credit, payments, and savings services (Gao et al., 2023; Baiyere et al., 2023; Heriberta et al., 2025). However, emerging evidence increasingly indicates that these benefits are neither automatic nor evenly distributed across firms and contexts.

This inconsistency is widely conceptualized as the digital productivity paradox, where substantial investments in digital technologies fail to yield proportional improvements in productivity and firm performance (Brynjolfsson et al., 2021; Tambe et al., 2020). The paradox highlights that technology does not create value in isolation; rather, value emerges from complementary organizational capabilities, human capital investments, managerial competencies, and institutional support systems that enable firms to reorganize around digital technologies (Wade & Hulland, 2004; Teece, 2023).

In developing economies, this paradox is further intensified by contextual challenges that compound the capability gap. Infrastructure deficits, limited digital literacy, weak institutional frameworks, and constrained access to finance significantly undermine the effective utilization of digital technologies (OECD, 2022; UNCTAD, 2023; Digital Government Authority, 2025). Nigeria reflects this contradiction in a particularly pronounced manner. Despite significant growth in digital platforms, a vibrant fintech ecosystem, and widespread mobile phone penetration, MSMEs in Nigeria continue to experience low productivity, limited growth, and high failure rates (SMEDAN, 2021; NBS, 2022). This suggests a fundamental disconnect: access to digital technologies alone is insufficient to drive meaningful performance improvements without complementary capabilities and enabling conditions.

A critical factor explaining this persistent gap is entrepreneurial orientation (EO), which captures a firm's strategic posture in terms of innovativeness, proactiveness, and risk-taking (Covin & Wales, 2019; Lumpkin & Dess, 2021; Mutinda et al., 2025). Firms with strong EO are more likely to experiment with digital tools, identify emerging opportunities, proactively adapt their operations, and commit resources to uncertain but potentially rewarding digital initiatives. From a dynamic capabilities' perspective, such firms are better positioned to sense opportunities embedded in digital technologies, seize them through strategic investment, and reconfigure their resources and operations to generate value (Teece, 2023). Without this strategic orientation, digital adoption remains superficial, limited to transactional usage rather than strategic integration, and fails to produce meaningful performance outcomes.

Equally important is the role of the external institutional environment, particularly government policy. Government policies shape the availability of digital infrastructure, regulatory clarity, and access to digital support systems such as training, advisory services, and financial incentives (Adeniyi & Adeeko, 2024; CPA Australia, 2025). In contexts where government policies are supportive, consistent, and well-implemented, firms are more likely to derive value from their digital investments. Conversely, policy instability, weak infrastructure investment, and inadequate institutional support can significantly undermine the effectiveness of digital adoption (John, 2024; Dahiya et al., 2025).

Despite growing scholarly attention to digital transformation in MSMEs, important gaps remain in the literature. Existing studies largely focus on direct relationships between digital adoption and performance, neglecting the underlying mechanisms and contextual conditions that shape these relationships. The role of entrepreneurial orientation as a mediating mechanism has received limited empirical attention in developing economy contexts. Similarly, the moderating role of government policy in conditioning the digital adoption-performance relationship has been underexplored. Moreover, empirical research remained concentrated in major commercial centres, leaving regions such as Ondo State significantly underexplored (Fatusin & Oladehinde, 2018).

Against this backdrop, this study investigated the structural relationships between multidimensional digital technology adoption and MSME performance, incorporating entrepreneurial orientation as a mediator and government policy as a moderator in Ondo State, Nigeria. Specifically, the study addressed the following research questions: Does digital technology adoption influence the performance of MSMEs? Does multidimensional digital technology adoption influence financial and non-financial performance? Does digital technology adoption influence entrepreneurial orientation? Does entrepreneurial orientation influence MSME performance? Does entrepreneurial orientation mediate the relationship between digital technology adoption and MSME performance? Does government policy moderate the relationship between digital technology adoption and MSME performance?

2. Literature Review and Hypothesis Development

2.1 Conceptual Review

2.2 Digital Technology Adoption and Msme Performance

Digital technology adoption encompasses the systematic integration of digital tools, platforms, and infrastructures into organizational processes to enhance efficiency, competitiveness, and value creation. Within the MSME context, digital adoption includes ICT tools, digital marketing platforms, e-commerce systems, financial technologies (FinTech), and digital accounting systems.

Empirical evidence consistently indicates that digital technology adoption enhances performance outcomes for MSMEs. Studies show that ICT integration improves operational efficiency, reduces transaction costs, enhances communication systems, and increases overall productivity (Simon-Oke & Aderibaki, 2020; Okundaye et al., 2019; Mbama et al., 2025). Digital marketing adoption has been shown to significantly improve sales volumes, customer engagement, and brand visibility (Gontur et al., 2023; Olakunle et al., 2024; Hanggono et al., 2025). E-commerce platforms enable MSMEs to overcome spatial barriers, reach wider audiences, and diversify revenue streams (Gao et al., 2023; Okolo-obasi et al., 2025; Susanto et al., 2025). FinTech adoption promotes financial inclusion, improves transaction efficiency, and enhances cash flow management (Ibosiola & Dada, 2024; Usman et al., 2025; El-Mahdy et al., 2026).

However, the relationship between digital adoption and performance is not uniform across all technology types. Different digital tools may exert different effects on performance dimensions. For instance, while digital marketing may directly enhance customer engagement and sales, basic ICT adoption may require complementary investments in skills and processes to generate performance benefits (Onodugo et al., 2026). This study therefore conceptualizes digital technology adoption as a multidimensional construct comprising ICT, digital marketing, e-commerce, and FinTech dimensions, and hypothesizes:

H1a: ICT adoption has a positive effect on financial performance of MSMEs.

H1b: ICT adoption has a positive effect on non-financial performance of MSMEs.

H1c: Digital marketing adoption has a positive effect on financial performance of MSMEs.

H1d: Digital marketing adoption has a positive effect on non-financial performance of MSMEs.

H1e: E-commerce adoption has a positive effect on financial performance of MSMEs.

H1f: E-commerce adoption has a positive effect on non-financial performance of MSMEs.

H1g: FinTech adoption has a positive effect on financial performance of MSMEs.

H1h: FinTech adoption has a positive effect on non-financial performance of MSMEs.

2.3 Digital Technology Adoption and Entrepreneurial Orientation

Entrepreneurial Orientation (EO) represents a firm's strategic posture encompassing innovativeness, proactiveness, and risk-taking (Lumpkin & Dess, 1996). EO is widely recognized as a determinant of firm performance and an enabler of technology utilization (Covin & Wales, 2019; Mutinda et al., 2025).

Digital technology adoption may influence EO through several mechanisms. First, exposure to digital platforms exposes MSME owners to new business models, market trends, and customer insights, stimulating innovative thinking (Ojeka-John et al., 2025; Zherlitsyn et al., 2025). Second, digital tools enable firms to experiment with new products, services, and processes at lower cost, encouraging risk-taking behaviour (Muhammad et al., 2025; Dahiya et al., 2025). Third, digital technologies provide real-time market intelligence, enabling firms to identify opportunities and act proactively (Cuevas-Vargas et al., 2022; Seppänen et al., 2025).

Empirical studies support the positive relationship between digital adoption and EO. Mayowa et al. (2017) found that firms with more entrepreneurial owners demonstrated higher levels of technology utilization. Cunningham et al. (2023) reported that digital capabilities enhance entrepreneurial mindset and opportunity recognition. Recent studies have further confirmed that the adoption of digital tools strengthens EO dimensions, particularly in developing-economy contexts (Santoso et al., 2025; El-Mahdy et al., 2026). Based on this evidence, we hypothesize:

H2: Digital technology adoption has a positive effect on entrepreneurial orientation of MSMEs.

2.4 Entrepreneurial Orientation and MSME Performance

Extensive empirical research has examined the relationship between EO and firm performance, with the preponderance of evidence supporting a positive association. Meta-analyses confirm that EO is consistently related to performance, though the strength varies across contexts (Rauch et al., 2009; Covin & Wales, 2019; Mutinda et al., 2025).

Firms with strong EO are more likely to identify and exploit opportunities, innovate continuously, and adapt to changing market conditions (Lumpkin & Dess, 2021). Such firms demonstrate greater willingness to experiment with novel strategies, proactively shape their competitive environment, and commit resources to uncertain but potentially rewarding ventures. These capabilities enable EO-oriented MSMEs to achieve superior financial outcomes, including increased sales, profitability, and market share, as well as enhanced non-financial performance indicators such as customer satisfaction, employee morale, and organisational reputation (Seppänen et al., 2025; Hanggono et al., 2025).

In the Nigerian context, studies have confirmed that EO significantly influences SME productivity and growth (Ogunsiji & Ladanu, 2010; Ahmadu et al., 2025). Recent evidence further suggests that EO serves as a critical mechanism through which MSMEs in developing economies translate digital investments into tangible performance gains (Santoso et al., 2025; Onodugo et al., 2026). Based on this evidence, we hypothesize:

H3a: Entrepreneurial orientation has a positive effect on financial performance of MSMEs.

H3b: Entrepreneurial orientation has a positive effect on non-financial performance of MSMEs.

2.5 The Mediating Role of Entrepreneurial Orientation

The theoretical logic suggests that digital technology adoption may enhance performance partly through its influence on entrepreneurial orientation. Digital tools provide the platform for experimentation, market intelligence, and operational flexibility that underpin EO (Ojeka-John et al., 2025; Zherlitsyn et al., 2025). In turn, EO enables firms to leverage these digital resources strategically for performance improvement. Without this mediating orientation, digital adoption remains an inert resource that fails to generate performance gains (Cunningham et al., 2023; Dahiya et al., 2025).

This mediating role is consistent with the dynamic capabilities' perspective, which emphasizes that value creation depends on the firm's ability to reconfigure resources and adapt to changing environments (Teece, 2023). Entrepreneurial orientation operationalizes these dynamic capabilities, enabling digital technologies to translate into improved performance outcomes (Mutinda et al., 2025; El-Mahdy et al., 2026).

Recent empirical studies have provided support for this mediating pathway. Santoso et al. (2025) found that EO partially mediated the relationship between digital adoption and SME performance in Indonesia. Similarly, Onodugo et al. (2026) reported that entrepreneurial mindset served as a transmission mechanism through which digital capabilities influenced firm growth in Sub-Saharan Africa. These findings underscore that digital technologies alone do not guarantee performance improvements; rather, their value is realized when firms possess the entrepreneurial orientation to identify opportunities, take calculated risks, and innovate continuously (Seppänen et al., 2025; Hanggono et al., 2025).

Based on this theoretical and empirical foundation, we hypothesize:

H4a: Entrepreneurial orientation mediates the relationship between digital technology adoption and MSME financial performance.

H4b: Entrepreneurial orientation mediates the relationship between digital technology adoption and MSME non-financial performance.

2.6 The Moderating Role of Government Policy

Government policy encompasses the institutional framework, regulatory environment, infrastructure provisions, and development programs that enable firms to access, adopt, and benefit from digital technologies.

Institutional Theory emphasizes that organizational actions and outcomes are significantly shaped by the "rules of the game" within their environment (North, 1990; Scott, 1995; Dahiya et al., 2025).

Government policy may moderate the digital adoption-performance relationship through several mechanisms. Supportive policies reduce adoption barriers by improving infrastructure, lowering costs, and providing training (Ahmadu et al., 2025; Santoso et al., 2025). Regulatory clarity reduces uncertainty, encouraging deeper digital integration (Zhu & Kraemer, 2005; Digital Government Authority, 2025). Financial incentives enable investment in complementary capabilities that enhance the returns from digital adoption (Adeniyi & Adeeko, 2024; CPA Australia, 2025).

Conversely, weak policies create barriers that impede effective utilization. Inconsistent policy implementation, regulatory bottlenecks, and inadequate infrastructure can neutralize the benefits of digital adoption (John, 2024; Olatunji et al., 2025). Recent studies have confirmed that policy support significantly strengthens the positive effects of digital adoption on MSME performance in developing economies (Heriberta et al., 2025; Mbama et al., 2025). El-Mahdy et al. (2026) further demonstrated that government-backed digital inclusion programs enhanced the performance outcomes of technology adoption among small firms. Similarly, Onodugo et al. (2026) found that institutional quality moderated the digital capabilities-performance nexus in Sub-Saharan Africa.

Despite this evidence, the precise moderating role of government policy in the Nigerian MSME context remains underexplored. This study therefore examines whether government policy strengthens or weakens the relationship between digital adoption and both financial and non-financial performance outcomes. Based on this theoretical and empirical foundation, we hypothesize:

H5a: Government policy moderates the relationship between digital technology adoption and MSME financial performance.

H5b: Government policy moderates the relationship between digital technology adoption and MSME non-financial performance.

2.7 Conceptual Framework

Based on the theoretical, conceptual and empirical review, a conceptual framework is developed (Figure 1). Digital technology adoption (comprising ICT, digital marketing, e-commerce, and FinTech dimensions) serves as the independent variable. Entrepreneurial orientation mediates the relationship between digital adoption and performance. Government policy moderates the digital adoption-performance relationships. MSME performance is conceptualized as a multidimensional construct comprising financial and non-financial dimensions.

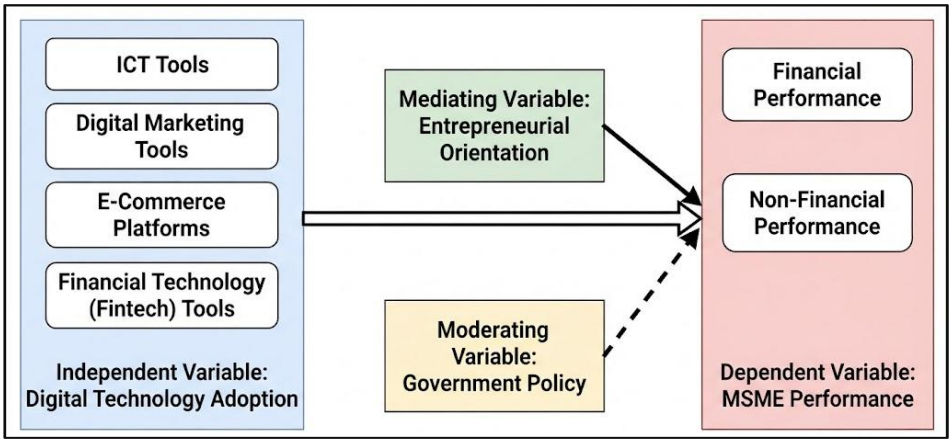


Figure 1: *Conceptual Framework*

Source: Researchers' Conceptualization (2026)

2.8 Theoretical Framework

This study integrates five complementary theoretical perspectives to explain the complex relationships among digital technology adoption, entrepreneurial orientation, government policy, and MSME performance.

The Technology Acceptance Model (TAM) (Davis, 1989) explains individual-level adoption decisions through perceived usefulness and perceived ease of use. TAM suggests that MSME owners are more likely to adopt digital technologies when they perceive these tools as beneficial for business operations and easy to integrate into existing processes. This perspective is particularly relevant for understanding the initial adoption decisions that precede performance outcomes.

The Diffusion of Innovation (DOI) Theory (Rogers, 2003) complements TAM by explaining how digital technologies spread across firms over time. DOI emphasizes that adoption is influenced by perceived relative advantage, compatibility, complexity, trialability, and observability. This theory helps explain why adoption patterns are uneven across MSMEs, with some firms adopting technologies early while others lag behind.

The Resource-Based View (RBV) (Barney, 1991) shifts attention from adoption to the strategic resources that firms possess. RBV posits that firms achieve competitive advantage through valuable, rare, inimitable, and non-substitutable (VRIN) resources. Digital technologies are conceptualized as strategic assets that can enhance efficiency, market reach, and overall performance. However, RBV assumes that mere possession of resources leads to competitive advantage, an assumption that does not always hold in practice.

The Dynamic Capabilities Theory (Teece et al., 1997) addresses this limitation by explaining how firms utilize their resources. This perspective emphasizes the ability of firms to integrate, reconfigure, and deploy resources in response to changing environments. Within this framework, entrepreneurial orientation is conceptualized as a critical capability that enables MSMEs to derive value from digital technologies.

Institutional Theory (DiMaggio & Powell, 1983; Scott, 1995) highlights how formal structures, such as government policies, regulatory frameworks, and infrastructure, influence firm behaviour. This theory explains how the institutional environment shapes the effectiveness of digital adoption, with supportive policies enhancing performance outcomes and weak policies limiting their impact.

3. Methodology

3.1 Research Design and Study Area

This study adopted a quantitative, cross-sectional survey research design. The study was conducted in Ondo State, Nigeria, located in the South-Western geopolitical zone. Ondo State was selected due to its diverse economic structure, growing entrepreneurial activity, and representation of both urban and rural business environments. The state spans three senatorial districts: Ondo Central, Ondo North, and Ondo South.

3.2 Population And Sampling

The population comprised all registered MSMEs in Ondo State. According to SMEDAN (2023), the state has an estimated 93,350 registered MSMEs. Using Yamane's formula at 5% margin of error, a sample size of 400 was determined. A multi-stage sampling technique was employed: first, stratification by senatorial districts; second, purposive selection of commercial centres; and third, simple random sampling of MSMEs within these locations. Sample allocation across districts was proportional: Ondo Central (40%, n=160), Ondo South (35%, n=140), and Ondo North (25%, n=100).

3.3 Data Collection Instruments

Data were collected using a structured questionnaire. The instrument comprised five sections: demographic profile, digital technology adoption (16 items across ICT, digital marketing, e-commerce, and FinTech dimensions), entrepreneurial orientation (9 items covering innovativeness, proactiveness, and risk-taking), government policy (9 items covering digital infrastructure, regulatory support, and capacity-building), and MSME performance (12 items covering financial and non-financial performance). All items were measured on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

3.4 Validity and Reliability

Content validity was established by adapting measurement items from well-validated scales in prior empirical studies. The instrument was reviewed by experts in entrepreneurship, management, and research methodology. A pilot test with 30 MSME owners in Ilesa (outside the study area) yielded Cronbach's Alpha values ranging from 0.85 to 0.91 across constructs, indicating strong internal consistency.

3.5 Data Collection Procedure

Data were collected through a mixed-mode approach combining physical distribution and online platforms (Google Forms). Trained research assistants facilitated access to respondents, distributed questionnaires, and ensured timely retrieval. Ethical considerations were strictly observed: participation was voluntary, confidentiality was assured, and respondents provided informed consent.

3.6 Data Analysis

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. PLS-SEM was chosen for its suitability in analyzing complex models with multiple constructs, mediating and moderating relationships, and its robustness with non-normal data (Hair et al., 2019). The analysis followed a three-stage approach: (1) measurement model assessment (indicator reliability, internal consistency, convergent validity, discriminant validity), (2) structural model evaluation (path coefficients, R^2, effect sizes, predictive relevance), and (3) mediation and moderation analysis using bootstrapping with 5,000 subsamples.

4. Results

4.1 Descriptive Statistics and Response Rate

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

Variable	Category	Frequency	Percentage (%)
Senatorial District	Ondo Central	113	28.25
	Ondo North	160	40.00
	Ondo South	127	31.75
Type of Business	Manufacturing	47	11.75
	Retail/Wholesale	161	40.25
	Service	143	35.75
	Agriculture	17	4.25
	Others	32	8.00
Number of Employees	1–5	266	66.50
	6–20	56	14.00
	21–50	36	9.00
	51 and above	42	10.50
Years of Operation	Less than 1 year	14	3.50
	1–3 years	85	21.25
	4–6 years	53	13.25
	More than 6 years	248	62.00
Respondent Position	Owner	280	70.00
	Manager	56	14.00
	Supervisor	18	4.50
	Staff	42	10.50
	Others	4	1.00

Source: Field Survey (2026)

Table 2: Descriptive Statistics

Construct	Mean	Standard Deviation	Skewness	Kurtosis
Digital Marketing Tools	3.881	0.734	-0.412	-0.116
E-Commerce	3.640	0.702	-0.381	-0.201
FINTECH Adoption	3.704	0.759	-0.293	-0.082
ICT Adoption	3.852	0.711	-0.447	-0.105
Entrepreneurial Orientation	3.921	0.668	-0.520	0.118
Government Policy	3.501	0.780	-0.225	-0.334
Financial Performance	3.792	0.723	-0.331	-0.097
Non-Financial Performance	3.881	0.694	-0.421	-0.155

Out of 450 questionnaires distributed, 420 were retrieved, and after screening for completeness, 400 valid responses were retained, representing an 88.89% valid response rate. The demographic profile showed that respondents were distributed across senatorial districts (Ondo Central 28.25%, Ondo North 40.00%, Ondo South 31.75%). The majority of businesses were in retail/wholesale (40.25%) and services (35.75%). Micro-enterprises (1-5 employees) constituted 66.50% of the sample, and 70.00% of respondents were business owners.

Descriptive statistics (Table 2) showed moderate to high levels of agreement across all constructs, with Entrepreneurial Orientation yielding the highest mean (3.92). Skewness and kurtosis values were within acceptable thresholds (±2).

4.2 Measurement Model Assessment

Indicator reliability was assessed through outer loadings. All indicators exceeded the recommended threshold of 0.70, except EO9 (0.577), which was retained due to its theoretical relevance. Internal consistency reliability was confirmed through Cronbach's Alpha (0.710-0.914), rho_A (0.712-0.933), and Composite Reliability (0.821-0.934), all exceeding 0.70. Convergent validity was established through Average Variance Extracted (AVE) values ranging from 0.535 to 0.737, all exceeding 0.50. Discriminant validity was confirmed using the Heterotrait-Monotrait (HTMT) ratio, with all values below the conservative threshold of 0.85.

Table 3: Outer Loadings of Constructs

Construct	Indicators	Loadings	Decision
Digital Marketing Tools (DMT)	DMT1	0.719	Retained
	DMT2	0.779	Retained
	DMT3	0.915	Retained
	DMT4	0.792	Retained
	DMT5	0.827	Retained
E-Commerce (E-COMM)	ECO1	0.723	Retained
	ECO2	0.726	Retained
	ECO3	0.723	Retained
	ECO4	0.721	Retained
	ECO5	0.720	Retained
FINTECH	FIN2	0.680	Retained
	FIN3	0.774	Retained
	FIN4	0.720	Retained
	FIN5	0.710	Retained
Information Communication Technology (ICT)	ICT1	0.891	Retained
	ICT2	0.853	Retained
	ICT3	0.854	Retained
	ICT4	0.860	Retained
	ICT5	0.870	Retained

Construct	Indicators	Loadings	Decision
Entrepreneurial Orientation (EO)	EO1	0.863	Retained
	EO2	0.850	Retained
	EO3	0.840	Retained
	EO4	0.831	Retained
	EO5	0.822	Retained
	EO6	0.815	Retained
	EO7	0.808	Retained
	EO8	0.800	Retained
	EO9	0.577	Retained*
Government Policy (GOVTPLC)	GOV1	0.795	Retained
	GOV2	0.769	Retained
	GOV3	0.725	Retained
	GOV4	0.720	Retained
	GOV5	0.724	Retained
Financial Performance (FINPER)	FP1	0.765	Retained
	FP2	0.719	Retained
	FP3	0.760	Retained
	FP4	0.740	Retained
	FP5	0.840	Retained
Non-Financial Performance (NONFINPERM)	NFP1	0.817	Retained
	NFP2	0.797	Retained
	NFP3	0.791	Retained
	NFP4	0.786	Retained
	NFP5	0.781	Retained
	NFP6	0.784	Retained

Source: SmartPLS Output (2026)

4.3 Structural Model Evaluation

The structural model demonstrated substantial explanatory power. The model explained 49.1% of the variance in Entrepreneurial Orientation ($R^2 = 0.491$), 62.1% of the variance in Financial Performance ($R^2 = 0.621$), and 57.5% of the variance in Non-Financial Performance ($R^2 = 0.575$). Predictive relevance (Q^2) values were all substantially above zero (0.324-0.412), confirming adequate predictive capability.

4.4 Hypothesis Testing

Table 4: Direct Effects and Hypotheses Testing

Hypothesis	Path	B	t-value	p-value	Decision
H1	Digital Marketing Tools → Entrepreneurial Orientation	0.227	4.239	0.000	Supported
H2	Digital Marketing Tools → Financial Performance	0.144	2.822	0.005	Supported
H3	Digital Marketing Tools → Non-Financial Performance	0.173	4.170	0.000	Supported
H4	Digital Technology Adoption (FINTECH) → Entrepreneurial Orientation	0.662	14.770	0.000	Supported
H5	Digital Technology Adoption (FINTECH) → Financial Performance	-0.257	5.079	0.000	Supported*
H6	Digital Technology Adoption (FINTECH) → Non-Financial Performance	0.014	0.219	0.827	Not Supported
H7	E-Commerce → Entrepreneurial Orientation	-0.026	0.409	0.683	Not Supported
H8	E-Commerce → Financial Performance	0.230	4.271	0.000	Supported
H9	E-Commerce → Non-Financial Performance	0.025	0.415	0.678	Not Supported
H10	Entrepreneurial Orientation → Financial Performance	0.394	9.150	0.000	Supported
H11	Entrepreneurial Orientation → Non-Financial Performance	0.502	8.999	0.000	Supported
H12	Government Policy → Financial Performance	0.347	7.125	0.000	Supported
H13	Government Policy → Non-Financial Performance	0.187	4.391	0.000	Supported

Source: SmartPLS Output (2026)

Direct Effects

Table 4 presents the results of direct effects testing. Digital marketing tools significantly enhanced entrepreneurial orientation ($\beta = 0.227$, $p < 0.001$), financial performance ($\beta = 0.144$, $p = 0.005$), and non-financial performance ($\beta = 0.173$, $p < 0.001$), supporting H1c, H1d, and H2.

FinTech adoption strongly predicted entrepreneurial orientation ($\beta = 0.662$, $p < 0.001$) but exerted a negative direct effect on financial performance ($\beta = -0.257$, $p < 0.001$) and no significant direct effect on non-financial performance ($\beta = 0.014$, $p = 0.827$), supporting H1g only for the EO relationship.

E-commerce adoption significantly improved financial performance (β = 0.230, p < 0.001) but showed no significant effect on entrepreneurial orientation (β = -0.026, p = 0.683) or non-financial performance (β = 0.025, p = 0.678), supporting H1e only.

Entrepreneurial orientation significantly improved financial performance (β = 0.394, p < 0.001) and non-financial performance (β = 0.502, p < 0.001), supporting H3a and H3b. Government policy demonstrated significant direct effects on both financial performance (β = 0.347, p < 0.001) and non-financial performance (β = 0.187, p < 0.001).

Mediation Effects

The indirect effect of FinTech adoption on financial performance through entrepreneurial orientation was positive and significant (β = 0.261, p < 0.001). This indicates that while FinTech adoption has a negative direct effect on financial performance, its overall effect is positive when mediated through EO, supporting H4a. Similarly, digital marketing showed a positive indirect effect through EO (β = 0.089, p < 0.001), supporting partial mediation.

Table 5: Indirect Effects (Mediation) Entrepreneurial Orientation

Path	Indirect Effect	p-value	Interpretation
Digital Technology Adoption (FINTECH) → Entrepreneurial Orientation → Financial Performance	0.261	0.000	Significant Mediation
Digital Marketing Tools → Entrepreneurial Orientation → Financial Performance	0.089	0.000	Significant Mediation

Source: SmartPLS Output (2026)

Moderation Effects

Government policy demonstrated significant moderating effects, though with mixed directions. It negatively moderated the relationships between digital marketing and financial performance (β = -0.209, p < 0.001), digital marketing and non-financial performance (β = -0.242, p < 0.001), and e-commerce and financial performance (β = -0.243, p < 0.001). However, it positively moderated the relationship between ICT and financial performance (β = 0.291, p < 0.001), supporting H5a but only partially supporting H5b.

Table 6: Moderation Results (Government Policy)

Interaction	B	p-value	Decision
Government Policy × Digital Marketing Tools → Financial Performance	-0.209	0.000	Significant
Government Policy × Digital Marketing Tools → Non-Financial Performance	-0.242	0.000	Significant
Government Policy × E-Commerce → Financial Performance	-0.243	0.000	Significant
Government Policy × ICT → Financial Performance	0.291	0.000	Significant

Source: SmartPLS 4.0 Output (2026)

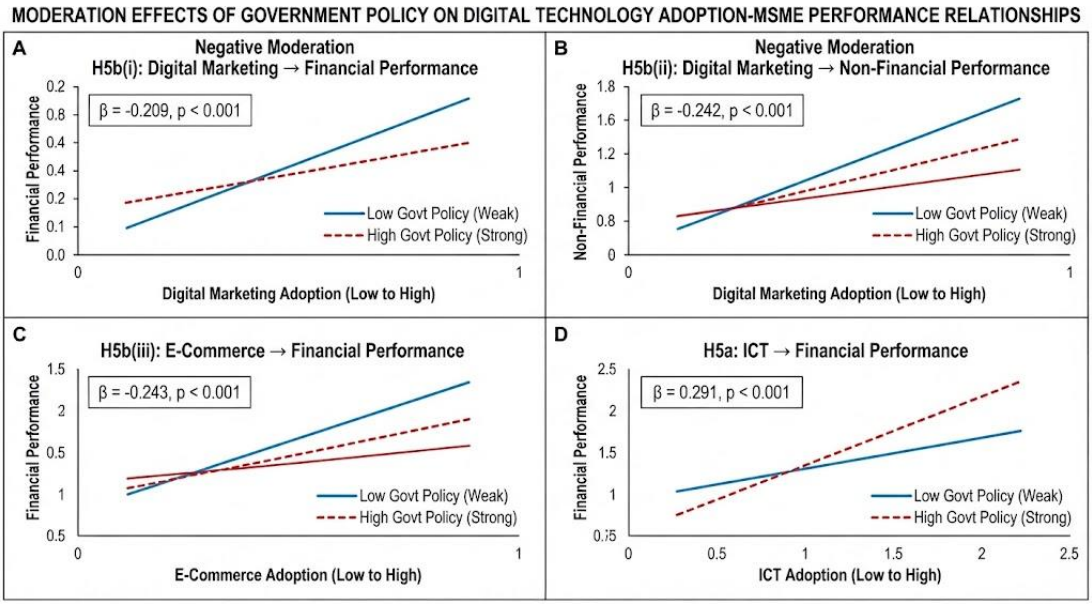


Figure 2: *Moderating effect of government policy on digital technology adoption*

5. Discussion

5.1 Digital Technology Adoption and MSME Performance

The positive effects of digital marketing on financial and non-financial performance align with prior studies demonstrating its role in enhancing customer engagement and sales growth (Kolawole, 2022; Gontur et al., 2023). Digital marketing platforms enable MSMEs to interact directly with customers, receive feedback, and tailor offerings, thereby strengthening market responsiveness.

The positive effect of e-commerce on financial performance supports Gao et al. (2023) and Okolo-obasi et al. (2025), who found that e-commerce improves sales and market expansion. However, non-significant effects on EO and non-financial performance suggest MSMEs use e-commerce transactionally rather than strategically.

The negative direct effect of FinTech on financial performance, despite positive indirect effects through EO, reveals a digital productivity paradox. Implementation costs and training expenses may initially reduce performance, while long-term benefits are realized through enhanced entrepreneurial capabilities (Brynjolfsson et al., 2021; Tambe et al., 2020).

Non-significant ICT effects suggest basic adoption may be poorly implemented or not yet strategically utilized, consistent with evidence from developing economies where infrastructural challenges limit effective utilization (Fatusin & Oladehinde, 2018; Adeniyi & Adeeko, 2024).

5.2 The Mediating Role of Entrepreneurial Orientation

The strong positive effect of digital adoption on EO, and subsequent positive effects on performance, confirm EO as a critical mediating mechanism. Digital technologies enhance EO by exposing MSMEs to new business models, enabling experimentation, and providing market intelligence. In turn, EO enables firms to leverage digital resources strategically.

This finding extends prior research by empirically demonstrating EO's mediating role, responding to calls for greater attention to mediating mechanisms (Taruté & Gatautis, 2014; Mikalef & Pateli, 2017). The positive indirect effect of FinTech through EO, despite negative direct effects, suggests FinTech's value is realized through entrepreneurial capabilities rather than direct efficiency gains.

5.3 The Moderating Role of Government Policy

Mixed moderating effects revealed a complex and context-specific role. Negative moderation of government policy on digital marketing and e-commerce may reflect compliance burdens that disproportionately affect MSMEs, including taxation and data protection regulations (John, 2024). Alternatively, policy misalignment may mean generic frameworks do not address specific barriers.

Positive moderation of the ICT-performance relationship indicates policies supporting basic digital infrastructure, broadband expansion, and skills training are more effective for fundamental adoption than advanced applications. Policy effectiveness depends on alignment with specific technology domains and firm needs (Zhu & Kraemer, 2005; Bindeeba et al., 2025).

6. Conclusion

This study investigated structural relationships between multidimensional digital technology adoption and MSME performance, with EO as mediator and government policy as moderator in Ondo State, Nigeria. The findings confirm that digital adoption does not automatically enhance performance; effectiveness depends on EO and enabling policy.

Different digital technologies produce different outcomes. Digital marketing and e-commerce demonstrated positive performance effects, while FinTech showed negative direct effects but positive indirect effects through EO, confirming that adoption without strategic readiness may be counterproductive.

EO emerged as the central driver, exerting the strongest influence on both financial and non-financial outcomes. Government policy played significant but inconsistent roles, highlighting a mismatch between interventions and MSME realities.

6.1 Theoretical Contributions

This study advanced the integration of multiple theoretical perspectives (TAM, DOI, RBV, Dynamic Capabilities, Institutional Theory) into a coherent framework, addressing single-theory limitations by accounting for adoption drivers, resource heterogeneity, and institutional context.

It extended RBV and Dynamic Capabilities Theory by demonstrating that digital resources alone do not guarantee competitive advantage; value is realized through firm-level entrepreneurial orientation (Teece, 2023). Empirical evidence confirmed EO as a mediating mechanism (Mutinda et al., 2025; Santoso et al., 2025).

It enriched Institutional Theory by evidencing uneven, technology-specific policy effects in developing economies. Mixed moderating effects revealed institutional support must be calibrated to different digital technologies (Dahiya et al., 2025; El-Mahdy et al., 2026), extending Scott's (1995) institutional pillars framework to the digital MSME context.

It responded to calls for greater attention to mediating mechanisms (Cunningham et al., 2023; Onodugo et al., 2026), addressing the "black box" of how digital adoption translates into performance.

6.2 Practical Implications

For MSME owners and managers, simply adopting digital tools is insufficient, as performance gains ultimately depend on their strategic utilization through innovative practices. Owners must prioritize digital marketing and e-commerce, which have demonstrated consistent positive effects, while developing entrepreneurial capabilities through continuous learning and experimentation. Furthermore, they need to recognize that FinTech requires a complementary entrepreneurial orientation (EO) to translate into actual gains, as evidenced by negative direct but positive indirect effects.

For policymakers, establishing supportive institutional frameworks, digital infrastructure, regulatory stability, and capacity building is critical, with policies needing to be targeted, technology-specific, and context-sensitive. Policymakers should reduce regulatory burdens by simplifying business registration and easing tax compliance for digital businesses, while improving digital infrastructure, particularly internet connectivity and electricity, in underserved regions. Additionally, they must provide targeted capacity-building programs that address entrepreneurial skill gaps rather than relying on generic subsidies, develop technology-specific interventions that recognize the distinct challenges across ICT, digital marketing, e-commerce, and FinTech, and strengthen institutional coordination between the government, financial institutions, and technology providers to foster an enabling ecosystem.

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