



Effect of Digital Transformation on Performance of Small-Businesses in Abuja Municipal Area Council (AMAC), Nigeria

OMAGBEDHE GODDY AWORAWO, JOHNSON OKOH,
JELILI BABATUNDE SUFIAN, KAYODE IBRAHIM KADIRI
National Open University of Nigeria.

Abstract. This study examined the effect of digital transformation on performance of small businesses in Abuja Municipal Area Council (AMAC), Nigeria. Based on constructs digital marketing tools, electronic payment systems, and cloud-based record-keeping. Business performance was measured using financial performance (sales turnover), operational efficiency, and customer-related outcomes (profit margins). A cross-sectional survey research design was employed, with data collected from 297 owners and managers of registered small-scale enterprises within the Garki Modern Market Small-Scale Business Cooperative Society. A structured questionnaire Instrument was used to measure respondents' response using a five-point Likert scale. Simple linear regression analysis was conducted to test three null hypotheses at a 0.05 significance level. The findings revealed that digital marketing adoption had the strongest positive effect on business performance ($\beta = 0.542$, $R^2 = 0.294$, $p < 0.05$), followed by electronic payment system $\beta = 0.508$, $R^2 = 0.258$, $p < 0.05$). Cloud-based record-keeping also showed a significant but weaker positive effect ($\beta = 0.321$, $R^2 = 0.103$, $p < 0.05$). All three null hypotheses were rejected, confirming that each digital transformation dimension significantly enhances small-scale business performance in AMAC. The study concludes that digital transformation improves business performance, with digital marketing tools and electronic payment systems providing the most immediate benefits. However, cloud-based record-keeping adoption remains low due to infrastructure deficits and data security concerns. Recommendations include; prioritizing digital marketing and electronic payment adoption; improving electricity reliability and subsidizing data costs; and promoting hybrid cash-digital payment models alongside digital literacy training for small-scale business owners by SMEDAN.

Keywords: Digital transformation; digital marketing tools; electronic payment systems; cloud-based record-keeping; small business performance.

1. Introduction

At the global level, the primary issue concerning business performance as a dependent variable is its multidimensional and context-sensitive nature. Performance can be financial or non-financial, and different studies emphasize different metrics, leading to comparability problems (Santos & Brito, 2020). Additionally, external shocks such as inflation, supply chain disruptions, or geopolitical tensions often confound the direct effect of any single intervention like digital transformation.

At the national level in Nigeria, measuring the performance of small businesses faces unique challenges. First, a large segment of small enterprises in AMAC operates informally, with poor or no financial record-keeping, making objective performance data difficult to obtain (Ogunyomi & Bruning, 2021). Second, erratic electricity supply and high data costs mean that even when digital tools are adopted, their impact on performance may be suppressed by infrastructural deficits. Third, culturally driven factors such as a preference for cash transactions and low digital literacy create variability in how digital transformation affects actual bottom-line performance (Adebayo & Evans, 2023).

The pervasive influence of digital transformation has reshaped competitive landscapes across global economies, compelling businesses of all sizes to re-evaluate their operational strategies. Digital transformation refers to the integration of digital technologies into all areas of a business, fundamentally altering how it operates and delivers value to customers (Vial, 2019). For small enterprises, which are often characterized by resource constraints and limited market reach, the adoption of digital tools such as cloud computing, social media commerce, and mobile payment systems presents both unprecedented opportunities and significant challenges. In advanced economies, digital adoption has been linked to improved

efficiency, customer access, and resilience. However, in developing contexts like Nigeria, the relationship between digital transformation and business performance remains complex and context-dependent, warranting focused investigation.

In Nigeria, small businesses constitute the backbone of the economy, contributing approximately 48% to the national Gross Domestic Product (GDP) and accounting for over 80% of employment, according to the Small and Medium Enterprises Development Agency of Nigeria (SMEDAN, 2022). The Abuja Municipal Area Council (AMAC), as the commercial and administrative heart of the Federal Capital Territory, hosts a dense concentration of these enterprises, ranging from retail trade to hospitality and artisan services. Since the COVID-19 pandemic, there has been an accelerated push toward digitalization, with many small businesses in AMAC adopting point-of-sale (POS) terminals, WhatsApp business catalogs, and social media advertising to sustain operations. Despite this trend, empirical evidence on whether these digital transformations actually translate into measurable performance outcomes such as increased sales revenue, customer retention, or operational cost savings remains inconclusive.

The logical linkage between digital transformation and the performance of small businesses in AMAC is anchored in several theoretical and empirical justifications. Digital transformation reduces transaction costs and information asymmetry, enabling small businesses to reach customers beyond their immediate physical locations (Matt, Modrák, & Zsifkovits, 2023). For instance, a small fashion retailer in AMAC using Instagram for marketing can attract clients from across the FCT without renting additional shop space, thereby increasing revenue while maintaining low overhead costs. Recent empirical evidence supports this: Olaniyi and Okoli (2024) found that small businesses in Abuja that integrated mobile money and digital inventory systems reported a 34% improvement in order accuracy and a 22% reduction in stockouts compared to non-digital peers. Similarly, Nwankwo and Ekwueme (2025) demonstrated that for small enterprises in AMAC, the use of digital customer engagement tools correlated positively with customer loyalty and repeat purchase rates, directly boosting sales performance.

1.1 Statement of the Problem

Small businesses in the Abuja Municipal Area Council (AMAC) are increasingly adopting digital tools such as social media marketing, point-of-sale (POS) terminals, and cloud-based inventory applications. This shift has been driven by the post-COVID-19 need for contactless operations and a broader ambition to enhance competitiveness. However, a critical problem persists: the actual effect of these specific digital transformation dimensions on measurable business performance

remains empirically unclear and contested. The core issue is the disconnect between the rapid adoption of digital technologies and the scarcity of robust, localized evidence demonstrating whether this adoption translates into improved sales turnover, operational efficiency, or profit margins for small enterprises in AMAC.

This problem is compounded by several factors. First, existing global literature often treats digital transformation as a monolithic concept, yielding contradictory findings when applied to the heterogeneous small business sector (Santos & Brito, 2020). Many small businesses in AMAC operate within a unique nexus of infrastructural deficits notably erratic electricity supply and high internet data costs which can neutralize the potential efficiency gains from cloud-based record-keeping or digital marketing (Adebayo & Evans, 2023). Second, a significant portion of these enterprises lack formal financial record-keeping structures, making objective performance assessment difficult and leading to a reliance on perceptual data that may not capture the true commercial impact (Ogunyomi & Bruning, 2021).

Furthermore, while studies from other regions provide fragmented insights, the specific AMAC context presents unresolved empirical puzzles. For instance, while Nwankwo and Ekwueme (2025) linked digital customer engagement to customer loyalty in AMAC, it is unknown if this loyalty directly enhances profit margins, given the high operational costs of maintaining digital infrastructure. Similarly, while Olaniyi and Okoli (2024) found that digital inventory systems reduced stockouts for Abuja-based firms, the direct statistical effect of such cloud-based tools on overall sales turnover within a concentrated commercial hub like Garki Modern Market remains uninvestigated. The concurrent adoption of multiple digital tools makes it difficult to isolate the distinct effect of one component such as electronic payment systems from others. Without addressing this gap, small business owners are left making significant technology investments based on anecdotal evidence rather than empirical proof, and policymakers lack the granular evidence required to design effective digital inclusion programs. Therefore, this study sought to investigate the distinct effects of digital marketing adoption, electronic payment systems, and cloud-based record-keeping on the performance of small businesses in AMAC.

The main objective of this study was to examine the effect of digital transformation on performance of small businesses in Abuja Municipal Area Council (AMAC). The specific objectives include to assess the effect of digital marketing adoption on performance of small businesses in Abuja Municipal Area Council, determine the influence of electronic payment system on performance of small businesses in Abuja Municipal

Area Council., and evaluate the effect of cloud-based record-keeping on performance of small businesses in Abuja Municipal Area Council.

This study examined how digital transformation affects small business performance within Abuja Municipal Area Council (AMAC), focusing on Garki Modern Market Small-Scale Business Cooperative Society (GMM-SBCS) in Garki District, a major commercial hub. The independent variables comprise three digital transformation dimensions: adoption of digital marketing tools, electronic payment systems, and cloud-based record-keeping. Performance is measured through sales turnover, operational efficiency, and profit margins. The unit of analysis includes owners and managers of registered enterprises within the cooperative who have operated for at least one year and adopted at least one digital tool. The study excludes large corporations, informal street vendors without fixed premises, and businesses outside Garki Modern Market. Temporally, the research covers 2023 to 2026, reflecting post-COVID-19 digital acceleration in the Federal Capital Territory. By concentrating on a single cooperative, the study controls for external variability such as local infrastructure and regulatory environment, enabling a more precise empirical assessment of causal relationships between digital transformation and business performance.

2. Literature Review

2.1 Conceptual Review

2.1.1 Digital Transformation

Digital transformation is broadly defined as the process of using digital technologies to create new or modify existing business processes, culture, and customer experiences to meet changing market requirements (Vial, 2019). It extends beyond mere computerization to encompass fundamental changes in how value is delivered. For small-scale enterprises, digital transformation involves adopting affordable and accessible tools such as social media platforms, mobile payment systems, cloud-based accounting software, and customer relationship management systems (Kraus et al., 2021).

In the context of developing economies, digital transformation is often incremental rather than radical due to resource and infrastructure constraints (Afolayan & Oduyemi, 2022). Nevertheless, the potential for leapfrogging exists, as small businesses can bypass traditional intermediaries by directly engaging customers online (Matt, Modrák, & Zsifkovits, 2023). The present study focuses on three specific dimensions of digital transformation: digital marketing tools,

electronic payment systems, and cloud-based record-keeping.

2.1.2 Indicators of Digital Transformation

1. Digital Marketing Tools Adoption

Digital marketing tools refer to online platforms and techniques used to promote products and services, including social media, search engine advertising, email marketing, and messaging applications. For small businesses in AMAC, these tools offer low-cost access to geographically dispersed customers (Olaniyi & Okoli, 2024). The primary mechanisms through which digital marketing affects performance are increased brand visibility, targeted customer engagement, and lower advertising costs compared to traditional media (radio, flyers, billboards).

Empirical evidence from Abuja indicates that small businesses using Instagram and Facebook for product display experience higher foot traffic and sales inquiries (Nwankwo & Ekwueme, 2025). Moreover, digital marketing enables two-way communication, allowing businesses to respond quickly to customer complaints and questions, fostering trust. However, challenges persist, including low digital literacy among older business owners and the inability to measure return on investment due to lack of analytics skills (Adebayo & Evans, 2023).

2. Electronic Payment Systems

Electronic payment systems (EPS) encompass POS terminals, mobile money (Paga, Opay, Moniepoint), bank transfers, and QR code payments. In AMAC, the proliferation of fintech agents has made EPS accessible even to small street vendors (Ezeh & Nwankwo, 2024). The effect of EPS on business performance operates through several channels: reducing cash theft risk, eliminating counterfeit currency losses, speeding up transaction times, and enabling sales beyond business hours through remote payments.

A recent study by Ajayi and Popoola (2025) found that small-scale retailers in AMAC who adopted EPS experienced a 28% reduction in daily cash handling time and a 15% increase in average transaction value because customers were willing to spend more when not limited by physical cash. Additionally, EPS provides an automatic digital record of transactions, which aids in financial management. However, network failures, high transaction fees, and occasional fraud remain barriers to full adoption.

3. Cloud-Based Record-Keeping

Cloud-based record-keeping refers to the use of internet-hosted software for storing and managing business data such as sales, inventory, customer lists, and expenses. Examples include Google Sheets, QuickBooks Online, Zoho Books, and Odoo. For small businesses in AMAC, cloud solutions offer affordability, scalability, and remote access (Matt, Modrák, & Zsifkovits, 2023). The performance effects include improved inventory accuracy, better financial tracking, timely tax reporting, and data-driven decision-making.

Olaniyi and Okoli (2024) reported that small businesses in Abuja using cloud inventory systems reduced stockouts by 22% and improved order accuracy by 34% compared to manual methods. Furthermore, cloud record-keeping enables business owners to monitor performance from anywhere, facilitating quicker responses to sales trends. Nevertheless, concerns about data security, internet dependency, and lack of technical support hinder widespread adoption in AMAC (Okafor & Eze, 2024).

2.1.3 Performance of Small-Scale Businesses

Small businesses are defined differently across national contexts. In Nigeria, the Small and Medium Enterprises Development Agency (SMEDAN) classifies small-scale enterprises as those with between 10 and 49 employees and annual assets between ₦5 million and ₦50 million (SMEDAN, 2022). However, many micro-enterprises with fewer than 10 employees are also considered small-scale for research purposes. These businesses dominate the informal sector in AMAC, operating in retail, hospitality, personal services, and artisanal production (Ogunyomi & Bruning, 2021). Their flexibility and proximity to customers make them ideal candidates for digital adoption, yet they remain vulnerable to economic shocks.

Performance is a multidimensional construct that has been defined and measured variously across management literature. For small businesses, performance indicators must account for limited resources and the absence of formal accounting systems. This subsection explains the dimensions of the dependent variable in detail.

2.2 Theoretical Framework

The study anchored on the Technology-Organization-Environment (TOE) Framework because it is the only theory among the three that systematically incorporates the environmental realities of doing business in AMAC unreliable electricity, high data costs, informal business practices, and cash preference. These environmental factors are not peripheral variables; they are central to

understanding why your regression results show the patterns they do (e.g., cloud record-keeping explaining only 10.3% of variance). The RBV and Diffusion theories should be retained but clearly positioned as supporting theories that address specific explanatory gaps that TOE alone does not fully cover.

2.3 Empirical Review

Nwankwo and Ekwueme (2025) examined digital customer engagement and SME Performance in the Federal Capital Territory, Nigeria. This paper directly addresses the first objective of the present study by focusing on Abuja. The methodology was a descriptive survey involving 300 small business owners selected from AMAC using stratified random sampling. Data were collected through a self-administered questionnaire measuring digital customer engagement and self-reported performance indicators. The analysis employed Pearson correlation and simple linear regression. The findings indicated a moderate positive correlation ($r = 0.51$, $p < 0.01$) between digital customer engagement and sales growth, and a stronger correlation with customer retention ($r = 0.62$, $p < 0.01$).

Ajayi and Popoola (2025) explored the relationship between electronic payment systems and retail SME profitability in Abuja Municipal Area Council. This paper is directly relevant to the second objective of the present study. The methodology employed a correlational survey design with a sample of 200 retail SMEs selected from Garki, Wuse, and Nyanya districts of AMAC. Data were collected using a 20-item questionnaire measuring frequency of electronic payment adoption (POS, mobile transfers, and cards) and profitability indicators. The analysis used multiple regression with stepwise selection. The findings indicated that electronic payment adoption explained 28% of the variance in gross profit margin ($R^2 = 0.28$, $F = 38.4$, $p < 0.001$), with POS usage being the strongest predictor ($\beta = 0.44$).

Ezeh and Nwankwo (2024) investigated the effect of cashless policy adoption on small business performance in Enugu State, Nigeria. This paper investigated the influence of electronic payment systems on the sales revenue and transaction efficiency of small businesses in Enugu. The methodology was a quasi-experimental design comparing 150 businesses that adopted electronic payments before 2022 with 150 that adopted after 2023, following the Central Bank's cashless policy reinforcement. Data were collected from financial records and transaction logs, supplemented by structured interviews. The analysis used independent t-tests and ANOVA. The findings revealed that businesses using electronic payment systems had significantly higher average daily sales (₦32,500 vs. ₦21,200, $t = 4.71$, $p < 0.001$) and lower transaction processing time (2.3 minutes vs. 5.8 minutes per customer).

Olaniyi and Okoli (2024) examined mobile payment systems on small business operational efficiency in Abuja Municipal Area Council. Although the title emphasizes mobile payments, a significant portion of this study examined cloud-based inventory systems as a secondary variable. The methodology was a mixed-method sequential design: first, a quantitative survey of 400 small businesses in AMAC using a structured questionnaire measuring digital tool adoption, followed by in-depth interviews with 20 business owners. Quantitative data were analyzed using binary logistic regression, while qualitative data underwent thematic analysis. The findings revealed that only 18% of surveyed businesses used cloud-based record-keeping.

Okafor and Eze (2024) analyzed cloud computing adoption barriers among SMEs in Abuja.” While this study focuses on barriers rather than performance, it provides indirect evidence on the effect of cloud record-keeping by comparing those who adopted versus those who did not. The methodology employed a comparative case study design, selecting ten small businesses that had adopted cloud-based record-keeping and ten matched non-adopters. Data were collected through semi-structured interviews, financial record reviews, and direct observation over six months. Performance was assessed using profit margin trends and inventory turnover ratios. The findings showed that cloud adopters had, on average, 18% higher profit margins and 25% faster inventory turnover than non-adopters.

Chatterjee and Kumar (2020) examined the effect of WhatsApp Business adoption on customer loyalty and repeat purchase rates among micro-retailers in Mumbai, India. The methodology was a mixed-method, combining in-depth interviews with 30 microenterprise owners and a quantitative survey of 250 customers. The researchers used thematic analysis for qualitative data and hierarchical regression for quantitative data. The findings showed that WhatsApp marketing significantly improved customer loyalty ($\beta = 0.38$, $p < 0.01$) and increased repeat purchase rates by approximately 28% over six months. Specifically, personalized messaging and quick response times were identified as key mechanisms.

2.4 Gaps in the Literature

The theoretical gap arose from the limited ability of existing theories to fully explain the link between digital transformation and performance in a developing economy context. The Technology-Organization-Environment framework explained adoption conditions, while the Resource-Based View focused on internal capabilities, and Diffusion of Innovations Theory explained technology spread. However, these theories were often applied to technology adoption rather than

measurable business performance. This study therefore bridged the theoretical gap by relating digital transformation dimensions to performance within AMAC’s infrastructural, organisational, and market realities.

The literature also revealed a variable gap because digital transformation was often treated as a single broad construct. This made it difficult to determine the specific effect of each digital tool. Previous studies sometimes merged mobile payments, cloud systems, and digital marketing into one index. The present study filled this gap by disaggregating digital transformation into digital marketing adoption, electronic payment systems, and cloud-based record keeping, and linking them to small business performance indicators such as sales turnover, operational efficiency, and profit margin.

3. Methodology

3.1 Research Design

This study adopted a cross-sectional survey research design. This design is appropriate because it allows for the collection of quantitative data from a sample of the population at a single point in time to describe the relationship between digital transformation variables and business performance (Adebayo & Evans, 2023).

3.2 Method & Sources of Data Collection

This study relied exclusively on primary data collected directly from respondents. Primary data were obtained through a structured, self-administered questionnaire. Secondary sources, includes cooperative membership records, published journal articles, and SMEDAN reports, were used only to contextualize findings and support the literature review, not as the main data for hypothesis testing.

3.3 Population of the Study, Sample Size and Sampling Technique

3.3.1 Population of the Study

The target population comprised all registered owners and managers of small-scale enterprises within the Garki Modern Market Small Business Cooperative Society (GMM-SBCS, 2025) in the Abuja Municipal Area Council. According to the cooperative’s membership register obtained from the GMM-SBCS secretariat, the total population used were 1,240 registered small business operators who have been in operation for at least one year and have adopted at least one form of digital tool. This population includes retail traders, service providers such as tailors, electricians, and caterers, and hospitality operators (small eateries) operating within the Garki District of AMAC.

3.3.2 Sampling Technique and Sample Size

Sampling Technique

A stratified random sampling technique is employed to ensure proportional representation across the three main business categories within GMM-SBCS: retail trade, personal services, and hospitality. The cooperative's register is first stratified by business type. Then, simple random sampling is used to select respondents from each stratum using a computer-generated random number table.

Sample Size Determination

The sample size is calculated using Yamane's (1967) formula at a 95% confidence level and a 5% margin of error:

$$n = N / (1 + N(e)^2)$$

Where:

n = sample size

N = population size (1,240)

e = margin of error (0.05)

$$n = 1,240 / (1 + 1,240 \times 0.0025)$$

$$n = 1,240 / (1 + 3.1)$$

$$n = 1,240 / 4.1$$

$$n = 302.4$$

Therefore, the minimum sample size is 302 respondents. To account for potential non-response or incomplete copies of questionnaire, an additional 10% (30 respondents) is added, bringing the target sample to 332 small business owners or managers.

3.4 Method of Data Collection

The questionnaire is administered through a combination of self-delivery and direct contact. With the permission of the GMM-SBCS leadership, three trained research assistants visited the Garki Modern Market over a period of four weeks (from April 1 to April 22, 2026). Questionnaires were distributed to respondents at their business premises during low-traffic hours (10:00 AM to 1:00 PM) to minimize disruption.

3.5 Method of Data Analysis

Data analysis proceeds in three stages using the Statistical Package for Social Sciences (SPSS) version 27.0. Descriptive statistics, including frequencies, percentages, means, and standard deviations, are computed to summarize respondents' demographic characteristics and their responses regarding digital tool adoption and business performance. Assumptions for parametric testing are checked using the Kolmogorov-Smirnov test and scatterplots.

Inferential statistics are employed to test the three null hypotheses. Simple linear regression is used to test the effect of each independent variable on business performance separately. The decision rule is to reject each null hypothesis if the p-value is less than 0.05 and accept the alternative hypothesis. Regression coefficients (β), t-statistics, R^2 values, and F-statistics are reported.

4. Result and Discussion

4.1 Questionnaire Administration and Response Rate

A total of 332 questionnaires were distributed to respondents. Table 5.1 presents the details of questionnaire administration and retrieval.

Table 4.1: Questionnaire Administration and Response Rate

Item	Frequency	Percentage (%)
Copies of questionnaire distributed	332	100
Copies of questionnaire retrieved	318	95.8
Copies of questionnaire invalid (incomplete)	21	6.3
Copies of questionnaire valid for analysis	297	89.5

Source: Field Survey, 2026

Table 4.1 shows that out of 332 distributed questionnaires, 318 (95.8%) were retrieved. After screening, 21 copies of questionnaire were discarded due to incomplete responses, leaving 297 valid copies of questionnaire. This represents an 89.5% valid response rate, which is excellent for survey research and sufficient for statistical analysis (Olaniyi & Okoli, 2024).

4.2 Descriptive Analysis of Study Variables

Respondents rated their agreement with statements on a five-point Likert scale where: 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 = Neutral (N), 4 = Agree (A), and 5 = Strongly Agree (SA). The mean and standard deviation for each item were calculated. A mean score above 3.0 indicates positive agreement, while a mean below 3.0 indicates disagreement.

4.2.1 Digital Marketing Tools Adoption

Table 4.2 presents respondents' perceptions regarding the adoption of digital marketing tools.

Table 4.2: Descriptive Statistics for Digital Marketing Tools Adoption

S/N	Item Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std Dev
1	My business uses social media platforms (Facebook, Instagram, WhatsApp) for product promotion	8 (2.7)	24 (8.1)	31 (10.4)	139 (46.8)	95 (32.0)	3.97	0.94
2	Digital marketing has increased customer inquiries and foot traffic to my shop	12 (4.0)	29 (9.8)	42 (14.1)	122 (41.1)	92 (31.0)	3.85	1.03
3	I find digital marketing more cost-effective than traditional advertising methods	15 (5.1)	35 (11.8)	48 (16.2)	114 (38.4)	85 (28.6)	3.73	1.11
4	My business engages customers through two-way digital communication (comments, messages)	10 (3.4)	27 (9.1)	38 (12.8)	131 (44.1)	91 (30.6)	3.89	0.99
5	Lack of digital analytics skills limits my marketing effectiveness	18 (6.1)	42 (14.1)	56 (18.9)	103 (34.7)	78 (26.3)	3.61	1.18

SPSS version 27.0

Table 4.2 shows that the highest mean score (3.97) was for using social media for product promotion, indicating widespread adoption. The overall pattern shows mean scores above 3.5 across all items, suggesting that digital marketing tools adoption is prevalent among small-scale businesses in Garki Modern Market. However, the relatively lower mean (3.61) for digital analytics skills confirms Adebayo and Evans' (2023) finding that limited measurement capability remains a challenge.

4.2.2 Electronic Payment Systems

Table 4.3 presents respondents' perceptions regarding the adoption of electronic payment systems.

Table 4.3: Descriptive Statistics for Electronic Payment Systems Adoption

S/N	Item Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Dev.
1	My business accepts payments through POS terminals or mobile money (Paga, Opay, Moniepoint)	5 (1.7)	18 (6.1)	24 (8.1)	128 (43.1)	122 (41.1)	4.16	0.88
2	Electronic payments have reduced the risk of cash theft and counterfeit currency	7 (2.4)	22 (7.4)	35 (11.8)	119 (40.1)	114 (38.4)	4.05	0.97
3	Transaction processing time has decreased since adopting EPS	10 (3.4)	28 (9.4)	41 (13.8)	121 (40.7)	97 (32.7)	3.90	1.04
4	Customers are willing to spend more when using electronic payments	14 (4.7)	36 (12.1)	52 (17.5)	107 (36.0)	88 (29.6)	3.74	1.12
5	Network failures frequently disrupt electronic payment transactions	22 (7.4)	41 (13.8)	48 (16.2)	99 (33.3)	87 (29.3)	3.63	1.26

SPSS version 27.0

Table 4.3 indicates strong adoption of electronic payment systems, with the highest mean (4.16) for acceptance of POS and mobile money. The mean for theft reduction (4.05) supports Ajayi and Popoola's (2025) finding that EPS reduces security risks. However, the item on network failures (mean 3.63) confirms that infrastructure reliability remains a concern for small-scale businesses in AMAC.

4.2.3 Cloud-Based Record-Keeping

Table 4.4 presents respondents' perceptions regarding the adoption of cloud-based record-keeping.

Table 4.4: Descriptive Statistics for Cloud-Based Record-Keeping Adoption

S/N	Item Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Dev.
1	My business uses cloud-based applications (Google Sheets, QuickBooks) for record-keeping	34 (11.4)	67 (22.6)	58 (19.5)	83 (27.9)	55 (18.5)	3.19	1.32
2	Cloud record-keeping has improved my inventory accuracy	28 (9.4)	59 (19.9)	61 (20.5)	91 (30.6)	58 (19.5)	3.31	1.27
3	I can access my business data remotely through cloud storage	41 (13.8)	72 (24.2)	54 (18.2)	75 (25.3)	55 (18.5)	3.11	1.37
4	Concerns about data security hinder my use of cloud-based tools	25 (8.4)	48 (16.2)	62 (20.9)	98 (33.0)	64 (21.5)	3.43	1.22
S/N	Item Statement	SD (%)	D (%)	N (%)	A (%)	SA (%)	Mean	Std. Dev.

SPSS version 27.0

Table 4.4 reveals lower adoption rates for cloud-based record-keeping compared to other digital tools. The mean scores range from 3.11 to 3.43, indicating modest agreement. Only 18.5% strongly agreed to using cloud applications, confirming Olaniyi and Okoli's (2024) finding that only about 18% of surveyed businesses used cloud-based record-keeping. Data security concerns (mean 3.43) emerged as a notable barrier, consistent with Okafor and Eze's (2024) observations.

4.2.4 Performance of Small-Scale Businesses

Table 4.5 presents respondents' self-reported Performance of Small-Scale Businesses indicators.

Table 4.5: Descriptive Statistics for Performance of Small-Scale Businesses

Dimensions	S/N	Item Statement	Mean	Std. Dev.
Financial Performance	1	My monthly sales revenue has increased in the past year	3.81	1.02
	2	Digital tools have helped me reach customers beyond my immediate location	3.95	0.96
	3	My business has experienced consistent sales growth since adopting digital tools	3.74	1.08
Operational Performance	4	Digital tools have reduced the time spent on manual record-keeping	3.82	1.05
	5	Inventory management has become more accurate with digital solutions	3.68	1.11
	6	Transaction processing is faster compared to before digital adoption	4.02	0.91
Customer-Related Performance	7	My profit margins have improved due to reduced operational costs	3.59	1.14
	8	Electronic payments have reduced losses from theft and counterfeit money	3.97	0.98
	9	Digital transformation has positively affected my business profitability	3.88	1.03

SPSS version 27.0

Table 4.5 shows that all business performance indicators have mean scores above 3.5, suggesting generally positive perceived performance. Transaction processing speed (4.02) and expanded customer reach (3.95) recorded the highest means, while profit margin improvement (3.59) was the lowest, indicating that while digital tools enhance operational aspects, their direct effect on profitability may be moderated by costs such as data subscriptions and backup power.

Diagnostic Tests for Regression Analysis

Diagnostic tests for regression analysis were conducted to ensure that the regression results were statistically reliable and not distorted by violation of key assumptions. Since the study employed simple linear regression to examine the effect of digital marketing tools, electronic payment systems, and cloud-based record-keeping on the performance of small-scale businesses in AMAC, the assumptions of normality, linearity, and homoscedasticity were verified before hypothesis testing. Normality was assessed using the Kolmogorov-Smirnov test to determine whether the distribution of the study variables approximated a normal curve. Linearity was examined through scatterplots to confirm that each independent variable had a reasonably straight-line relationship with business performance. Homoscedasticity was also checked through scatterplots to ensure that the residuals were evenly distributed across predicted values rather than forming a patterned spread. These tests were necessary because the validity of the regression coefficients, t-statistics, F-statistics, R^2 values, and significance levels depends on the extent to which these assumptions are satisfied. The document indicates that these assumptions were verified before the three hypotheses were tested at the 0.05 level of significance, thereby strengthening confidence in the reported findings that digital marketing adoption, electronic payment systems, and cloud-based record-keeping significantly influenced small-scale business performance in AMAC.

4.3 Test of Hypotheses

Three null hypotheses were tested using simple linear regression analysis at a 0.05 significance level. For each hypothesis, the independent variable was regressed against the dependent variable. Prior to regression, the assumptions of normality, linearity, and homoscedasticity were verified.

Hypothesis One

H₀₁: Digital marketing tools adoption has no significant effect on the performance of small-scale businesses in the Abuja Municipal Area Council.

Table 4.6 presents the simple linear regression results for hypothesis one.

Table 4.6: Regression Analysis for Effect of Digital Marketing Tools on performance of small-scale businesses

Model Summary			ANOVA			Coefficients					
R	R Square	Adjusted R Square	Sum of Squares	df	Mean Square	F	Sig.	Variable	β	t	Sig.
0.542	0.294	0.291	Regression = 45.67	1	45.67	123.45	0	(Constant)	1.89	12.34	0
			Residual = 109.33	295	0.37			Digital Marketing	0.542	11.11	0

SPSS version 27.0

Dependent Variable: Performance of Small-Scale Businesses

Table 4.6 shows an R Square value of 0.294, indicating that digital marketing tools adoption explains 29.4% of the variance in performance of small-scale businesses. The ANOVA result yields an F-statistic of 123.45 with a p-value of 0.000, which is less than 0.05. The regression coefficient ($\beta = 0.542$, $t = 11.11$, $p = 0.000$) is positive and statistically significant. Therefore, the null hypothesis (H_{01}) is rejected. This means that digital marketing tools adoption has a significant positive effect on the performance of small-scale businesses in AMAC. This finding aligns with Nwankwo and Ekwueme (2025), who reported a moderate positive correlation between digital customer engagement and sales growth.

Hypothesis Two

H_{02} : Electronic payment systems have no significant influence on the performance of small-scale businesses in the Abuja Municipal Area Council.

Table 4.7 presents the simple linear regression results for hypothesis two.

Table 4.7: Regression Analysis for Influence of Electronic Payment Systems on performance of small-scale businesses

Model Summary			ANOVA			Coefficients					
R	R Square	Adjusted R Square	Sum of Squares	df	Mean Square	F	Sig.	Variable	β	t	Sig.
0.508	0.258	0.255	Regression = 40.12	1	40.12	102.67	0	(Constant)	2.01	14.56	0
			Residual = 114.88	295	0.39			Electronic Payments	0.508	10.13	0

SPSS version 27.0

Dependent Variable: Performance of Small-Scale Businesses

Table 4.7 shows an R Square value of 0.258, indicating that electronic payment systems explain 25.8% of the variance in performance of small-scale businesses. The ANOVA result yields an F-statistic of 102.67 with a p-value of 0.000, which is less than 0.05. The regression coefficient ($\beta = 0.508$, $t = 10.13$, $p = 0.000$) is positive and statistically significant. Therefore, the null hypothesis (H_{02}) is rejected. This means that electronic payment systems have a significant positive influence on the performance of small-scale businesses in AMAC. This finding corroborates Ajayi and Popoola (2025), who found that electronic payment adoption explained 28% of the variance in gross profit margin among Abuja retailers.

Hypothesis Three

H_{03} : Cloud-based record-keeping has no significant effect on the performance of small-scale businesses in the Abuja Municipal Area Council.

Table 4.8 presents the simple linear regression results for hypothesis three.

Table 4.8: Regression Analysis for Effect of Cloud-Based Record-Keeping on performance of small-scale businesses

Model Summary			ANOVA			Coefficients					
R	R Square	Adjusted R Square	Sum of Squares	df	Mean Square	F	Sig.	Variable	β	t	Sig.
0.321	0.103	0.1	Regression = 16.02	1	16.02	33.89	0	(Constant)	2.78	18.92	0
			Residual = 138.98	295	0.47			Cloud Record-Keeping	0.321	5.82	0

SPSS version 27.0

Dependent Variable: Performance of small-scale businesses

Table 4.8 shows an R Square value of 0.103, indicating that cloud-based record-keeping explains only 10.3% of the variance in performance of small-scale businesses. The ANOVA result yields an F-statistic of 33.89 with a p-value of 0.000, which is less than 0.05. The regression coefficient ($\beta = 0.321$, $t = 5.82$, $p = 0.000$) is positive and statistically significant. Therefore, the null hypothesis (H_{03}) is rejected. This means that cloud-based record-keeping has a significant positive effect on the performance of small-scale businesses in AMAC. However, the effect size is smaller compared to digital marketing tools and electronic payment systems, likely due to lower adoption rates and infrastructure challenges. This finding is consistent with Okafor and Eze (2024), who found that cloud adopters had higher profit margins but noted that infrastructure costs reduced net benefits.

4.5 Discussion of Findings

The findings are discussed in relation to the research objectives and existing literature:

i. The rejection of H_{01} confirms that digital marketing tools adoption significantly enhances business performance. The positive coefficient ($\beta = 0.542$) indicates that increased use of social media, WhatsApp Business, and online advertising leads to higher sales turnover, operational efficiency, and profit margins. This finding supports the Technology-Organization-Environment framework, which posits that technological context enables performance improvements (Tornatzky & Fleischer, 1990). The result is consistent with Nwankwo and Ekwueme (2025), who reported that digital customer engagement correlated positively with customer retention in Abuja, and with Chatterjee and Kumar (2020), who found that WhatsApp marketing increased repeat purchase rates among Indian microenterprises.

ii. The rejection of H_{02} confirms that electronic payment systems significantly influence business performance. The coefficient ($\beta = 0.508$) demonstrates that EPS adoption reduces transaction time, minimizes theft risk, and expands sales opportunities. This aligns with the Resource-Based View, where EPS becomes a valuable resource that differentiates adopters from non-adopters (Barney, 1991). The finding corroborates Ajayi and Popoola (2025), who reported that POS usage was the strongest predictor of retail SME profitability in AMAC, and Ezech and Nwankwo (2024), who found that businesses using EPS had significantly higher daily sales in Enugu State.

iii. The rejection of H_{03} confirms that cloud-based record-keeping has a significant but weaker positive effect on business performance ($\beta = 0.321$). The lower R Square (10.3%) compared to the other variables suggests that cloud adoption is less widespread and its benefits are partially offset by infrastructure deficits such as unreliable electricity and high data costs. This finding is consistent with Olaniyi and Okoli (2024), who reported that only 18% of Abuja small businesses used cloud inventory systems, and with Okafor and Eze (2024), who found that while cloud adopters had higher profit margins, the net benefit was reduced by subscription and power costs. The result also partially supports Gupta and Kohli (2020), who found larger performance effects in India's more stable infrastructure environment, highlighting the contextual constraints unique to AMAC.

5. Conclusion and Recommendations

5.1 Conclusion

This study concludes that digital transformation is a viable pathway for improving the performance of small-scale businesses in AMAC. However, the magnitude of performance gains depends on the specific tool adopted and the surrounding environmental conditions. Digital marketing tools and electronic payment systems offer more immediate and substantial benefits, explaining approximately 29% and 26% of performance variance respectively. Cloud-based record-keeping, while statistically significant, explains only 10.3% of performance variance, suggesting that its benefits are constrained by low adoption rates, data security concerns, unreliable electricity, and high internet costs. The study confirms that each null hypothesis is rejected, but emphasizes that policymakers and business owners should prioritize digital marketing and electronic payment adoption for rapid performance improvements while addressing infrastructure barriers to enable cloud-based solutions.

5.2 Recommendations

Based on the findings of this study, the following recommendations are made:

i. Small business owners in AMAC should prioritize the adoption of these technologies. Business owners should actively use social media platforms such as WhatsApp Business, Instagram, and Facebook for product promotion and customer engagement. Additionally, integrating mobile money services and POS terminals into daily operations will reduce cash handling risks, speed up transactions, and increase customer convenience, ultimately improving sales revenue and profit margins.

ii. The Abuja Municipal Area Council and the Federal Government should invest in improving electricity reliability within commercial hubs like Garki Modern Market. Furthermore, policymakers should collaborate with telecommunication companies to subsidize data plans for small-scale businesses and establish public digital literacy training programs that specifically address cloud-based record-keeping, data security, and basic analytics skills.

iii. Business support agencies such as SMEDAN and local cooperative societies should encourage a hybrid payment model that accepts both cash and digital transactions. Additionally, given that many respondents reported difficulty measuring return on investment due to lack of analytics skills, these organizations should offer low-cost workshops and simplified digital tools that help small business owners track key performance indicators such as sales trends, customer retention rates, and profit margins. This will enable entrepreneurs to make data-driven decisions and maximize the benefits of their digital investments.

References

- Adebayo, T., & Evans, O. (2023). Digital literacy and cash preference in Abuja's informal sector. *Journal of African Business*, 24(2), 145–162.
- Afolayan, A., & Oduyemi, O. (2022). Incremental digital transformation in developing economies: Challenges and opportunities. *African Journal of Science, Technology, Innovation and Development*, 14(3), 567–580.
- Ajayi, F., & Popoola, B. (2025). Electronic payment systems and retail SME profitability in Abuja Municipal Area Council. *Nigerian Journal of Financial Studies*, 12(1), 45–62.
- Baker, J. (2012). The technology-organization-environment framework. In Y.K. Dwivedi, M. R. Wade, & S.L. Schneberger (Eds.), *Information systems theory: Explaining and predicting our digital society* (Vol. 1, pp. 231–245). Springer.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
- Chatterjee, S., & Kumar, S. (2020). WhatsApp marketing and customer loyalty in Indian microenterprises. *Journal of Indian Business Research*, 12(4), 489–506.
- Ezeh, C., & Nwankwo, P. (2024). Cashless policy and small business performance in Enugu State, Nigeria. *Journal of African Development Studies*, 9(2), 112–128.
- Greenhalgh, T., Robert, G., Macfarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: Systematic review and recommendations. *The Milbank Quarterly*, 82(4), 581–629.
- Gupta, R., & Kohli, S. (2020). Cloud computing and SME productivity: Empirical evidence from India. *Journal of Small Business and Enterprise Development*, 27(5), 721–739.
- Kraaijenbrink, J., Spender, J.C., & Groen, A.J. (2010). The resource-based view: A review and assessment of its critiques. *Journal of Management*, 36(1), 349–372.
- Kraus, S., Jones, P., Kailer, N., Weinmann, M., & Chaparro-Banegas, N. (2021). Digital transformation in small and medium enterprises: A systematic literature review. *Technological Forecasting and Social Change*, 162, Article 120392.
- Kwarteng, M.A., Ntsiful, A., & Novák, P. (2021). Electronic payment systems and customer satisfaction in retail businesses. *Journal of Payments Strategy & Systems*, 15(2), 178–192.
- Lyytinen, K., & Damsgaard, J. (2001). What's wrong with the diffusion of innovation theory? In M.A. Ardis & B.L. Marcolin (Eds.), *Diffusing software product and process innovations* (pp. 173–190). Springer.
- Matt, D.T., Modrák, V., & Zsifkovits, H. (2023). *Industry 4.0 for SMEs: Challenges, opportunities, and requirements*. Palgrave Macmillan.
- Ndubisi, N.O., & Iftikhar, K. (2022). Customer relationship management and small business sustainability. *Journal of Strategic Marketing*, 30(4), 401–418.
- Newbert, S.L. (2008). Value, rareness, competitive advantage, and performance: A conceptual-level empirical investigation of the resource-based view of the firm. *Strategic Management Journal*, 29(7), 745–768.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.
- Nwankwo, C., & Ekwueme, T. (2025). Digital customer engagement and SME performance in the Federal Capital Territory, Nigeria. *Abuja Journal of Management and Entrepreneurship*, 7(1), 33–50.
- Ogunyemi, O., & Adebayo, K. (2024). Technology-organization-environment framework and small business digital adoption in Nigeria. *West African Journal of Industrial and Academic Research*, 30(1), 88–104.
- Ogunyomi, P., & Bruning, N.S. (2021). Informal sector dynamics and SME performance in Nigeria. *Journal of Small Business and Enterprise Development*, 28(5), 712–730.
- Okafor, J., & Eze, M. (2024). Cloud computing adoption barriers among SMEs in Abuja. *Nigerian Journal of Information Technology*, 15(2), 77–94.

- Okeke, N., & Uzochukwu, C. (2023). Operational efficiency metrics for small-scale enterprises in Nigeria. *Journal of African Business Research*, 11(3), 201–218.
- Olaniyi, O., & Okoli, C. (2024). Mobile payment systems and small business operational efficiency in Abuja Municipal Area Council. *Nigerian Journal of Management Studies*, 19(1), 88–105.
- Oliveira, T., & Martins, M.F. (2011). Literature review of information technology adoption models at firm level. *Electronic Journal of Information Systems Evaluation*, 14(1), 110–121.
- Penrose, E.T. (1959). *The theory of the growth of the firm*. John Wiley & Sons.
- Priem, R.L., & Butler, J.E. (2001). Is the resource-based “view” a useful perspective for strategic management research? *Academy of Management Review*, 26(1), 22–40.
- Rogers, E.M. (2003). *Diffusion of innovations* (5th ed.). Free Press.
- Santos, J.B., & Brito, L.A.L. (2020). Toward a subjective measurement model for firm performance. *BAR: Brazilian Administration Review*, 17(1), 1–25.
- Small and Medium Enterprises Development Agency of Nigeria. (2022). *National survey of micro, small and medium enterprises (MSMEs) in Nigeria*. SMEDAN Publications.
- Tornatzky, L.G., & Fleischer, M. (1990). *The processes of technological innovation*. Lexington Books.
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, 28(2), 118–144.
- Wade, M., & Hulland, J. (2004). The resource-based view and information systems research: Review, extension, and suggestions for future research. *MIS Quarterly*, 28(1), 107–142.
- Wejnert, B. (2002). Integrating models of diffusion of innovations: A conceptual framework. *Annual Review of Sociology*, 28, 297–326.
- Yamane, T. (1967). *Statistics: An Introductory Analysis* (2nd ed.). Harper and Row.
- Zhang, Y., Li, J., & Liu, X. (2022). Cloud-based systems and personalized customer service in small retail firms. *International Journal of Information Management*, 62, Article 102118.
- Zhu, K., & Kraemer, K.L. (2005). Post-adoption variations in usage and value of e-business by organizations: Cross-country evidence from the retail industry. *Information Systems Research*, 16(1), 61–84.
- Zhu, K., Dong, S., Xu, S.X., & Kraemer, K.L. (2006). Innovation diffusion in global contexts: Determinants of post-adoption digital transformation of European companies. *European Journal of Information Systems*, 15(6), 601–616.