

# Digital Transformation Strategies in Enugu SMEs

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## ABSTRACT

This study investigated the digital transformation strategies adopted by small and medium enterprises (SMEs) in Enugu State, Nigeria, the extent of their adoption, the challenges militating against adoption, and the relationship between these strategies and SME performance. Anchored on the Diffusion of Innovation theory, the Technology–Organisation–Environment framework, and the Technology Acceptance Model, the study adopted a descriptive survey research design. A sample of 240 SME owner-managers was drawn from a population of 600 registered enterprises across three commercial clusters in Enugu metropolis using the Taro Yamane formula and stratified random sampling; 228 questionnaires were validly returned and analysed. Data were analysed using frequencies, percentages, means, standard deviations, and simple linear regression with SPSS version 25.0. Findings revealed that mobile money/point-of-sale services, social media marketing, and digital customer engagement were adopted to a high extent, while enterprise resource planning systems, company websites, and artificial intelligence/data analytics tools remained underutilised. Epileptic power supply, the high cost of data and digital equipment, and inadequate digital skills were identified as the most pressing barriers. Regression analysis showed a statistically significant positive relationship between digital transformation strategies and SME performance ( $R^2 = .37$ ,  $F(1, 226) = 133.41$ ,  $p < .001$ ). The study concludes that digital transformation, though unevenly adopted, meaningfully enhances the competitiveness of Enugu SMEs, and recommends targeted digital-skills training, affordable financing for technology acquisition, and improved power and broadband infrastructure.

**Keywords:** *digital transformation; ICT adoption; small and medium enterprises; business strategy; Enugu; Nigeria*

## 1. Introduction

The fourth industrial revolution has fundamentally altered the rules of competition for businesses of every size, pushing digital transformation from an optional efficiency exercise to a condition for survival. Digital transformation has been described as a process by which firms combine digital technologies and organisational capabilities to create and deliver new value, alter the structure of competition, and reconfigure how work is done (Vial, 2019). Westerman et al. (2014) frame it more practically as the use of technology to radically improve the performance or reach of an enterprise, spanning customer experience, operational processes, and business models. Verhoef et al. (2021) extend this view by distinguishing digitisation, digitalisation, and digital transformation as successive stages through which firms move from converting analogue information into digital form, to using that digital information to change operating processes, and finally to transforming the entire business model.

For small and medium enterprises (SMEs), which typically lack the financial buffers and specialist staff of larger corporations, digital transformation strategies are not a single grand initiative but an accumulation of smaller, affordable digital practices—ranging from mobile payments and social media marketing to cloud-based bookkeeping and e-commerce participation—that collectively reposition the firm for a digitally mediated marketplace.

Small and medium enterprises occupy a central place in national economic structures because of their employment-generating and innovation-diffusing capacity. In Nigeria, the National Bureau of Statistics and the Small and Medium Enterprises Development Agency of Nigeria reported that the country's roughly 39 million micro, small, and medium enterprises accounted for 96.9% of all businesses, 87.9% of employment, and 46.32% of gross domestic product (National Bureau of Statistics & SMEDAN, 2021). This scale notwithstanding, the same survey identified inadequate infrastructure, limited access to finance, and obsolete technology as persistent constraints on the sub-sector's productivity.

Enugu State, the commercial and administrative nerve centre of Nigeria's South-East geopolitical zone, hosts a dense population of trading, artisan, manufacturing, and service-oriented SMEs concentrated around clusters such as the Ogbete Main Market, the New Artisan Market, and the Abakpa and Trans-Ekulu commercial axes. These enterprises form the backbone of household income and local employment in the state, yet they operate within an environment characterised by unreliable electricity, comparatively high data costs, and uneven access to digital infrastructure, all of which condition the pace and form of digital transformation that is locally feasible.

Within the SME literature, digital transformation strategies commonly cover the adoption of mobile money and point-of-sale (POS) platforms, social media and instant-messaging-based marketing (notably WhatsApp Business, Facebook, and Instagram), participation in third-party e-commerce marketplaces, cloud-based accounting and inventory applications, company websites, bulk SMS or e-mail marketing, and, at a more advanced level, enterprise resource planning (ERP) systems and data analytics or artificial intelligence tools (Edim et al., 2025; Hafeez et al., 2025). These strategies differ markedly in cost, technical complexity, and organisational disruption, which explains why SMEs in developing economies often adopt the simpler, lower-cost tools first and defer or altogether avoid the more complex ones.

Three theoretical strands inform the present study. Rogers' (2003) Diffusion of Innovation theory explains adoption as a function of an innovation's relative advantage, compatibility, complexity, trialability, and observability, and predicts that SME owner-managers will adopt digital tools that are simple, affordable, and visibly beneficial more readily than complex ones. The Technology–Organisation–Environment (TOE) framework (Tornatzky & Fleischer, 1990) complements this by locating adoption decisions within three contexts: the technological context (perceived benefits and complexity of the tool), the organisational context (firm size, resources, and managerial attitude), and the environmental context (infrastructure, competitive pressure, and regulatory climate). Finally, the Technology Acceptance Model (Davis, 1989) underscores owner-managers' perceptions of usefulness and ease of use as proximate determinants of whether a digital tool, once available, is actually put to use.

Empirical evidence from within and outside Nigeria broadly supports a positive association between digital transformation and SME outcomes, while also documenting the structural barriers that temper this relationship. Edim et al. (2025) found that Nigerian SMEs balancing digital technology, human skills, and strategy recorded measurable gains in sales growth, innovation, and competitiveness, but cautioned that low adoption rates and limited training continue to constrain the sub-sector. Ebhota et al. (2024) reported that

digital transformation, alongside big-data analytics and disciplined budgetary control, significantly enhanced customer experience and financial performance among SMEs in South-West Nigeria. Closer to the present study's geographic focus, Emeali et al. (2024) found that digital transformation of the Igbo apprenticeship system had a significant positive effect on SME survivability in the South-East.

Outside Nigeria, Prakasa and Jumani (2024) found that digital capability improved small-business performance in East Java indirectly through digital business transformation. A systematic review by Hafeez et al. (2025) concluded that knowledge-management processes are a key enabler of successful digital transformation. On the constraint side, Bhalerao and Patil (2021) identified low awareness, the cost of technology, and weak ICT infrastructure as persistent preventing factors. Collectively, this body of work establishes a consistent pattern that existing studies have examined extensively in Lagos, the South-West, and the South-South, but far less so in Enugu State and the South-East more broadly. It is this empirical gap that the present study addresses.

### 1.1 Statement of the Problem

Despite growing policy attention to SME digitalisation and the demonstrated performance benefits documented in the literature, anecdotal observation across Enugu's commercial clusters suggests that digital transformation among local SMEs remains piecemeal, reactive, and rarely guided by a coherent strategy. Many owner-managers appear to adopt isolated tools, such as a WhatsApp Business account or a POS terminal, in response to customer expectations or competitor behaviour rather than as part of a deliberate digital strategy, while more transformative tools such as cloud accounting, e-commerce platforms, and data analytics remain largely untouched. Structural constraints, including epileptic power supply, the comparatively high cost of internet data and digital devices, and a shortage of digital skills among artisans and traders, are widely believed to underlie this pattern, yet the precise strategies in use, their extent of adoption, and their measurable association with SME performance in the Enugu context have not been systematically documented.

### 1.2 Objectives of the Study

The broad objective of this study was to examine digital transformation strategies and their relationship with the performance of SMEs in Enugu State. The specific objectives were to: (1) identify the digital transformation strategies adopted by SMEs in Enugu State; (2) determine the extent to which these strategies have been adopted; (3) examine the challenges militating against digital transformation among SMEs in Enugu State; and (4) assess the relationship between digital transformation strategies and the performance of SMEs in Enugu State.

### 1.3 Research Questions and Hypothesis

In line with the objectives, the study addressed the following research questions: What digital transformation strategies have been adopted by SMEs in Enugu State? To what extent have SMEs in Enugu State adopted these strategies? What challenges militate against digital transformation among SMEs in Enugu State? The following null hypothesis was tested at the 0.05 level of significance: H01: There is no

statistically significant relationship between digital transformation strategies and the performance of SMEs in Enugu State.

### 1.4 Significance of the Study

The findings of this study are expected to benefit SME owner-managers, policymakers including the Enugu State Ministry of Trade, Commerce, Industry and Wealth Creation and SMEDAN, financial institutions and digital solution providers, and the scholarly literature on SME digitalisation in Nigeria's South-East, a context that has received comparatively limited empirical attention.

## 2. Methodology

This study adopted a descriptive survey research design, which is appropriate for systematically describing the characteristics of a population and the relationships among variables as they naturally exist. The study was conducted in Enugu metropolis, focusing on three major commercial clusters—Ogbete Main Market, the New Artisan Market (Awkunanaw), and the Abakpa/Trans-Ekulu commercial axis—selected for their high concentration of registered SMEs spanning trading, services, manufacturing/artisan, and agribusiness activities.

The population comprised 600 SMEs registered with the Enugu State Ministry of Trade, Commerce, Industry and Wealth Creation across the three clusters at the time of the study. Using the Taro Yamane (1967) formula,  $n = N / (1 + N(e)^2)$ , with a population of 600 and a 5% margin of error, a sample size of 240 SME owner-managers was determined. Respondents were selected using a stratified random sampling technique, with the three commercial clusters serving as strata and proportionate allocation within each stratum, followed by simple random selection of individual SMEs.

Data were collected using a structured questionnaire titled the Digital Transformation Strategies and SME Performance Questionnaire (DTSPQ). Section A captured respondent and business demographic information; Section B measured the extent of adoption of nine digital transformation strategies on a four-point scale (Strongly Agree = 4 to Strongly Disagree = 1); Section C measured the severity of eight challenges to digital transformation on the same four-point scale; and Section D measured SME performance using indicators of sales growth, customer-base expansion, and operational efficiency. Face and content validity were established through review by three lecturers in the Department of Business Administration, Institute of Management Technology, Enugu. Reliability was confirmed through a pilot test of 30 SMEs outside the main sample, which yielded a Cronbach's alpha coefficient of 0.84.

Of the 240 copies of the questionnaire administered, 228 were correctly completed and returned, representing a 95.0% response rate. Data were analysed using frequencies and percentages for demographic data, mean and standard deviation for the extent of adoption and the severity of challenges (with a benchmark mean of 2.50 used to classify items as high or low extent/severity), and simple linear regression analysis to test the hypothesis, all computed with SPSS version 25.0 at the 0.05 level of significance.

### 3. Results

**Table 1.** Demographic characteristics of respondents ( $N = 228$ ).

| Variable                  | Category                     | Frequency | Percentage (%) |
|---------------------------|------------------------------|-----------|----------------|
| Gender                    | Male                         | 138       | 60.5           |
|                           | Female                       | 90        | 39.5           |
| Age (years)               | 18–30                        | 52        | 22.8           |
|                           | 31–40                        | 96        | 42.1           |
|                           | 41–50                        | 58        | 25.4           |
|                           | 51 and above                 | 22        | 9.6            |
| Educational qualification | WAEC/SSCE                    | 41        | 18.0           |
|                           | OND/NCE                      | 76        | 33.3           |
|                           | HND/B.Sc.                    | 93        | 40.8           |
|                           | Postgraduate                 | 18        | 7.9            |
| Business sector           | Trading/Retail               | 98        | 43.0           |
|                           | Services                     | 64        | 28.1           |
|                           | Manufacturing/Artisan        | 41        | 18.0           |
|                           | Agribusiness/Food processing | 25        | 11.0           |
| Years in business         | Less than 5                  | 79        | 34.6           |
|                           | 5–10                         | 88        | 38.6           |
|                           | 11–15                        | 41        | 18.0           |
|                           | Above 15                     | 20        | 8.8            |
| Business size (staff)     | 1–9 (Micro)                  | 142       | 62.3           |
|                           | 10–49 (Small)                | 67        | 29.4           |
|                           | 50–199 (Medium)              | 19        | 8.3            |

Note. Percentages are computed within each demographic variable and rounded to one decimal place.

As shown in Table 1, male respondents (60.5%) outnumbered female respondents, and most owner-managers (42.1%) were aged between 31 and 40 years. The majority held a Higher National Diploma or Bachelor's degree (40.8%), and trading/retail businesses constituted the largest sectoral group (43.0%). Most respondents had operated their businesses for five to ten years (38.6%) and employed fewer than ten persons (62.3%), confirming that the sample was dominated by micro and small enterprises typical of the Enugu commercial environment.

**Table 2.** Mean ratings of digital transformation strategies adopted by SMEs in Enugu State.

| S/N | Digital transformation strategy                                 | Mean | SD   | Decision    |
|-----|-----------------------------------------------------------------|------|------|-------------|
| 1   | Mobile money/POS services for transactions                      | 3.58 | 0.52 | High extent |
| 2   | Social media marketing (Facebook, Instagram, WhatsApp Business) | 3.41 | 0.61 | High extent |
| 3   | Digital/online customer engagement                              | 3.10 | 0.69 | High extent |

| S/N | Digital transformation strategy               | Mean | SD   | Decision    |
|-----|-----------------------------------------------|------|------|-------------|
| 4   | Online marketplaces/e-commerce platforms      | 2.78 | 0.74 | High extent |
| 5   | Bulk SMS/e-mail marketing                     | 2.61 | 0.80 | High extent |
| 6   | Cloud-based accounting/inventory applications | 2.22 | 0.88 | Low extent  |
| 7   | Company website/online storefront             | 2.05 | 0.91 | Low extent  |
| 8   | Enterprise resource planning (ERP) systems    | 1.84 | 0.85 | Low extent  |
| 9   | Artificial intelligence/data analytics tools  | 1.69 | 0.79 | Low extent  |
|     | Grand mean                                    | 2.59 |      | High extent |

Note. Decision rule: Mean  $\geq 2.50$  = high extent; Mean  $< 2.50$  = low extent. Scale: Strongly Agree = 4 to Strongly Disagree = 1.

Data in Table 2 indicate that the mobile money/POS service had the highest mean rating (M = 3.58, SD = 0.52), followed by social media marketing (M = 3.41, SD = 0.61) and digital customer engagement (M = 3.10, SD = 0.69). By contrast, ERP systems (M = 1.84, SD = 0.85) and artificial intelligence/data analytics tools (M = 1.69, SD = 0.79) recorded the lowest mean ratings. The grand mean of 2.59 suggests that digital transformation strategies have been adopted to a moderately high extent, but adoption is concentrated in low-cost, transaction- and marketing-related tools rather than in more structurally transformative systems.

**Table 3.** Mean ratings of challenges militating against digital transformation among Enugu SMEs.

| S/N | Challenge                                                  | Mean | SD   | Decision    |
|-----|------------------------------------------------------------|------|------|-------------|
| 1   | Epileptic/unstable power supply                            | 3.72 | 0.48 | High extent |
| 2   | High cost of internet data/bandwidth                       | 3.45 | 0.58 | High extent |
| 3   | Inadequate digital skills/ICT literacy among staff         | 3.38 | 0.63 | High extent |
| 4   | High cost of digital devices/equipment and software        | 3.21 | 0.66 | High extent |
| 5   | Poor broadband/network infrastructure                      | 3.05 | 0.71 | High extent |
| 6   | Limited access to credit/finance for technology investment | 2.96 | 0.77 | High extent |
| 7   | Fear of cyber fraud/insecurity of online transactions      | 2.84 | 0.81 | High extent |
| 8   | Multiple taxation and regulatory bottlenecks               | 2.67 | 0.85 | High extent |
|     | Grand mean                                                 | 3.16 |      | High extent |

Note. Decision rule: Mean  $\geq 2.50$  = high extent (severe). Scale: Strongly Agree = 4 to Strongly Disagree = 1.

As shown in Table 3, epileptic power supply was rated the most severe challenge ( $M = 3.72$ ,  $SD = 0.48$ ), followed by the high cost of internet data and bandwidth ( $M = 3.45$ ,  $SD = 0.58$ ) and inadequate digital skills among staff ( $M = 3.38$ ,  $SD = 0.63$ ). All eight listed challenges recorded mean scores above the 2.50 benchmark, with a grand mean of 3.16.

**Table 4.** Summary of simple linear regression analysis of digital transformation strategies and SME performance.

| Variable                          | B     | SE   | $\beta$ | t     | p     |
|-----------------------------------|-------|------|---------|-------|-------|
| (Constant)                        | 18.42 | 2.15 | —       | 8.57  | <.001 |
| Digital transformation strategies | 0.58  | 0.05 | .61     | 11.55 | <.001 |

Note.  $R = .61$ ,  $R^2 = .37$ , Adjusted  $R^2 = .37$ ,  $F(1, 226) = 133.41$ ,  $p < .001$ . Dependent variable: SME performance.

The regression model was statistically significant,  $R = .61$ ,  $R^2 = .37$ ,  $F(1, 226) = 133.41$ ,  $p < .001$ , indicating that digital transformation strategies accounted for approximately 37% of the variance in SME performance. The standardised coefficient ( $\beta = .61$ ,  $t = 11.55$ ,  $p < .001$ ) confirms a positive and significant relationship. Consequently, the null hypothesis ( $H_0$ ) was rejected.

#### 4. Discussion of Findings

The finding that mobile money/POS services and social media marketing are the most widely adopted digital transformation strategies among Enugu SMEs is consistent with Bhalerao and Patil's (2021) observation that SMEs in resource-constrained environments gravitate toward low-cost, high-visibility ICT tools before more complex systems. It also mirrors the pattern reported by Edim et al. (2025). The comparatively low adoption of ERP systems and AI/data analytics tools reflects the technological and organisational barriers anticipated by the TOE framework (Tornatzky & Fleischer, 1990): such tools demand technical skill, financial outlay, and organisational restructuring that most Enugu SMEs, being predominantly micro and small in scale, have not yet been able to absorb.

The identification of epileptic power supply, the high cost of data, and inadequate digital skills as the most severe challenges corroborates earlier Nigerian evidence and extends the South-East-specific finding of Emeali et al. (2024). These findings suggest that infrastructural and human-capital constraints, rather than outright resistance to technology, are the principal obstacles to deeper digital transformation in the state.

Finally, the significant positive relationship found between digital transformation strategies and SME performance reinforces the broader empirical consensus established by Ebhota et al. (2024) and Prakasa and Jumani (2024). The magnitude of the relationship recorded here ( $R^2 = .37$ ) indicates that digital transformation strategies are a meaningful, though not sole, determinant of SME performance in Enugu State.

#### 5. Conclusion and Recommendations

This study examined the digital transformation strategies adopted by SMEs in Enugu State, the extent of their adoption, the challenges militating against adoption, and the relationship between these strategies and

SME performance. The findings show that Enugu SMEs have embraced low-cost, transaction- and marketing-oriented digital tools, particularly mobile money/POS services and social media marketing, while more complex systems such as ERP and data analytics remain underutilised, largely on account of epileptic power supply, high data and equipment costs, and inadequate digital skills. Despite uneven adoption, digital transformation strategies were found to bear a statistically significant, positive relationship with SME performance.

The study recommends that the Enugu State Government, in collaboration with SMEDAN, institute targeted digital-skills training programmes; that financial institutions design affordable, SME-specific credit facilities for technology acquisition; that relevant agencies prioritise electricity and broadband improvements within major commercial clusters; that SME associations negotiate bulk access to digital tools and data services; and that owner-managers be encouraged, through advisory and mentorship schemes, to move beyond isolated tools toward more deliberate digital transformation.

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