

E-COMMERCE ADOPTION AND ITS EFFECT ON SMALL AND MEDIUM ENTERPRISES IN NORTHERN NIGERIA

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Abstract

This study focuses on E-commerce adoption and its effects on Small and Medium Enterprises (SMEs) in Northern Nigeria. The objective of the study is to identify the extent to which e-commerce has been adopted by SMEs in Northern Nigeria, identify the various challenges affecting the adoption of e-commerce among SMEs in Northern Nigeria and identify strategies that can facilitate the successful adoption of e-commerce among SMEs in Northern Nigeria. Using data from 400 SMEs, the research employs descriptive statistics and multivariate regression analysis. The findings of the study reveal that 50% of SMEs have fully adopted E-commerce, 30% have partially adopted, and 20% have not adopted E-commerce at all. Key challenges include lack of internet infrastructure (mean score = 3.88), high implementation costs (mean score = 3.80), lack of technical skills (mean score = 3.45), security concerns (mean score = 3.58), resistance to change (mean score = 3.30), and regulatory issues (mean score = 3.18). The study findings identify critical strategies such as improving internet infrastructure, reducing implementation costs, offering training and skill development, enhancing security measures, promoting awareness of E-commerce benefits, providing financial incentives, and simplifying regulatory requirements. The regression analysis for the hypothesis indicates that E-commerce adoption significantly enhances Sales Growth, Market Reach, Operational Efficiency, and Profitability, while Customer Satisfaction shows no significant impact. The study recommended that governmental and non-governmental organizations should provide training and skill development, strengthen security protocols, upgrade internet infrastructure, increase benefit awareness, offer financial incentives, and simplify regulatory requirements in order to encourage SMEs to adopt e-commerce. Also, in order to improve their overall business performance, SMEs should give priority to tactics that increase sales growth, penetrate new markets, and improve operational efficiency. This research contributes to the understanding of digital transformation in SMEs and provides actionable insights for policymakers, industry stakeholders, and business owners.

Key Words: E-commerce Adoption, SMEs, Northern Nigeria, Business Growth

Introduction

The swift progression of information and communication technologies has profoundly altered the worldwide commercial environment, offering organizations a range of prospects and obstacles. As a byproduct of these technical developments, e-commerce has transformed conventional business operations by facilitating transactions across digital platforms, hence increasing market penetration and enhancing operational effectiveness (Sharma, 2020). The continuous rise in the number of Internet users is also critical to the success of e-commerce (Khan, 2020). A few benefits of e-commerce include competitive advantage, cost savings, improved business processes, stronger client relationships, and access to the global market (Abed, et al., 2020). Because of these advantages, e-commerce is a very useful tool in this era of globalization. Even in emerging areas like Northern Nigeria, the use of e-commerce by small and medium-sized enterprises (SMEs) is still comparatively low, despite its potential. The expansion and competitive advantage of SMEs, which are essential to the economic development and employment creation in these regions, are hampered by this underutilization (Oluyinka, 2019).

In the context of increasing digitalization, Northern Nigeria provides as a microcosm of the larger potential and problems encountered by small and medium enterprises has proven on a global scale to be able to facilitate access to markets, optimize operations, and spur commercial growth for companies of all sizes. It is still unclear, though, how much Northern Nigerian small and medium-sized businesses have taken advantage of these benefits. With the emergence of the digital age, business models have undergone a significant upheaval, and e-commerce has emerged as a key factor influencing the modern economic environment in Northern Nigeria. In order to promote resilient economies, it is critical to comprehend how technology is redefining traditional commerce and how it affects local enterprises (Czinkota, et al., 2019).

Additionally, identifying the challenges faced by SMEs in adopting E-commerce is essential for addressing the barriers that prevent these enterprises from fully embracing digital platforms. Factors such as limited internet infrastructure, lack of digital literacy, financial constraints, and regulatory issues have been highlighted in existing literature as significant impediments (Bashir & Musa, 2019; Kazeem, 2017). Therefore, this study aims to assess E-commerce adoption and its effects on Small and Medium Enterprises in Northern Nigeria. The following research questions guide this study:

- a. To what extent has Small and Medium Enterprises adopted E-commerce in Northern Nigeria?
- b. What are the various challenges affecting the adoption of E-commerce among Small and Medium Enterprises in Northern Nigeria?
- c. What strategies can facilitate the successful adoption of E-commerce among Small and Medium Enterprises in Northern Nigeria?

This study, therefore, seeks to explore E-commerce adoption and its effects on Small and Medium Enterprises in Northern Nigeria. Specifically, the study aims to:

- i. To identify the extent to which e-commerce has been adopted by SMEs in Northern Nigeria.
- ii. To identify the various challenges affecting the adoption of e-commerce among SMEs in Northern Nigeria.
- iii. To identify strategies that can facilitate the successful adoption of e-commerce among SMEs in Northern Nigeria.

Hypothesis of the Study

The following hypotheses guided the study:

- H_0^1 : There is a positive relationship between the extent of E-commerce adoption and the sales growth of SMEs in Northern Nigeria.
- H_0^2 : E-commerce adoption positively impacts the market reach of SMEs in Northern Nigeria.
- H_0^3 : The adoption of E-commerce enhances the operational efficiency of SMEs in Northern Nigeria.
- H_0^4 : SMEs in Northern Nigeria that adopt E-commerce experience higher customer satisfaction compared to those that do not adopt E-commerce.
- H_0^5 : There is a positive relationship between E-commerce adoption and the overall profitability of SMEs in Northern Nigeria.

Review of Related Literature

Concept of E-commerce

The purchasing and selling of goods and services using the internet or other electronic networks is referred to as electronic commerce, or e-commerce. This idea includes a broad variety of internet-based business ventures for goods and services. It covers things like electronic markets, online auctions, and online retailing. Business to business (B2B), business to consumer (B2C), consumer to consumer (C2C), and consumer to business (C2B) are the four main market areas in which e-commerce is present (Laudon & Traver, 2021).

Concept of Small and Medium Enterprises (SMEs)

The phrase "small and medium enterprises" is frequently used to group companies according to their size, which is usually determined by elements like the total assets, yearly income, or number of employees. The exact standards used to define Small and Medium-Sized Enterprises can differ depending on the nation and sector. Small and medium-sized businesses are generally distinguished by their lower size when compared to larger organizations; nonetheless, because of their flexibility, inventiveness, and employment-generating capacity, they are important for economic development. Small and medium-sized businesses are crucial to a developing nation's economy. Numerous academics have maintained that small and medium-sized businesses form the backbone of any nation's economy (Zafar & Mustafa, 2017).

E-commerce Adoption and Small and Medium Enterprises

The process of incorporating electronic commerce technologies into smaller businesses' operations is known as "e-commerce adoption by SMEs. The market reach, operational effectiveness, and general competitiveness of SMEs are all significantly impacted by this adoption. Adoption of e-commerce entails the incorporation of digital payment methods, online platforms, and associated technology into SMEs business operations (Turban, et al., 2018). Small and Medium Enterprises can overcome regional limitations in their market reach by implementing e-commerce, which can help them expand SMEs audience and possibly even enter international markets (McKinsey Global Institute, 2020). By optimizing procedures like order fulfillment, inventory control, and customer relations, the integration of e-commerce platforms enhances operational efficiency (Chaffey & Ellis-Chadwick, 2019).

The Extent of E-commerce Adopted by Small and Medium Enterprises in Northern Nigeria

Small and Medium Enterprises (SMEs) in Northern Nigeria are gradually adopting e-commerce, although it is still less common than in other regions of the nation. This is mainly because of obstacles related to technological infrastructure, market knowledge, and budgetary restraints. Growth is impeded by inadequate internet connectivity and restricted access to digital technologies (Adewale, et al., 2020).

Challenges Affecting the Adoption of E-Commerce Among SMEs in Northern Nigeria

A lack of technical expertise, expensive implementation expenses, and inadequate internet infrastructure are some of the obstacles SMEs in Northern Nigeria must overcome to embrace e-commerce. 20% of SMEs, according to research, have not participated in e-commerce. A large portion of these businesses cite unstable internet connectivity as a primary deterrent (Abubakar, et al., 2023).

Strategies for Successful Adoption of E-Commerce Among SMEs in Northern Nigeria

Enhancing internet infrastructure through broadband and mobile internet expansion (Abubakar, et al., 2023), offering financial incentives like grants, tax breaks, or low-interest loans to lessen the financial burden (Sani, et al., 2024), and providing technical training and support to boost digital skills (Ibrahim & Musa, 2023) are some of the key strategies that should be put into practice to enhance the adoption of e-commerce among SMEs in Northern Nigeria.

Empirical Review

Mohammed, et al. (2022) examines the several contextual obstacles that Pakistani Small and Medium Enterprises encounter when implementing e-commerce. A qualitative research approach was chosen to meet the study's objectives, and it included both unstructured and semi-structured in-person interviews as well as telephone interviews. The Technology-Organization-Environment (TOE) framework was used in this study to identify many significant obstacles that SMEs faced when adopting e-commerce. Technology, organizational, environmental, institutional support (local and national) and owner-managers' entrepreneurial traits were the five main categories of problems that surfaced during

data analysis. This study demonstrates how quickly e-commerce is being adopted by Pakistani SMEs. The likelihood of e-commerce adoption increases when enthusiastic owner-managers and other staff members show an interest in technology and are eager to participate in e-commerce projects. The results of this study give policymakers a contextualized understanding of the real market, which they may use to create e-commerce regulations that support new business owners in SMEs and increase their capacity for innovation. Although the Technology-Organization-Environment (TOE) framework is frequently employed in studies of technology adoption, one noteworthy critique of Mohammed's work suggests that its application may ignore subtle aspects particular to the Pakistani SME setting. The framework's inability to fully capture the nuances of Pakistan's e-commerce adoption may limit the scope of the analysis.

The goal of Satar & Alarifi's (2022) research was to determine and experimentally examine the elements impacting Saudi Arabian SMEs' adoption of e-business on human behavior. A focus group interview with a panel of experts and a review of the existing literature served as the foundation for developing the framework. A questionnaire-based survey was then carried out, and information from 111 SMEs was gathered. The researchers used multiple regression analysis to test the model and related assumptions. The findings show that the adoption of e-business in SMEs is highly influenced by the following factors: company size, competitive pressure, innovativeness of the entrepreneur, and IT savvy.

The study by Boatenga, et al., (2021) looks into how small and medium-sized businesses in Ghana are implementing e-commerce. This study was conducted using a quantitative survey approach. Data was collected from a sample size of 291 SMEs representatives from four (4) Ghanaian administrative areas using a standardized questionnaire. The binary logistic regression model and Friedman test analytical methods were used in this investigation. According to the study's findings, the majority of SMEs in Ghana have embraced some level of e-commerce. The study also showed that perceived relative advantage, IT expertise of owners/managers, perceived risk/security element, and perceived compatibility with current infrastructure, culture, and values of the SMEs in Ghana all play a role in the choice to adopt and deploy e-commerce. The study found that high internet traffic, the expense of operating and maintaining e-commerce operations, service reliability issues, internet connection failures, and uncertainty surrounding the application of economies of scale and scope in partnership with strategic networks, the preservation of spotless ethical conduct by retail e-commerce firms, and the inclusion of protection and privacy policy statements on electronic platforms of firms are significant obstacles impeding ecommerce adoption among SMEs in Ghana. The report suggests that the government address issues, and its conclusions can inform policy decisions.

Theoretical Framework

TOE Framework

The Tornatzky, et al. (1990) framework, often known as the TOE framework, is often cited by researchers. It provides a thorough and guiding theoretical foundation for studying the adoption of e-commerce at the organizational and external levels by addressing a wide range of perspectives. The Technology and Entrepreneurship (TOE) framework identifies three primary factors that impact a business's adoption and application of technological innovation in Small and Medium Enterprises: The Technological, Organizational, and Environmental contexts (Arsalan & Saleem, 2022). Dotun (2019) asserts that the TOE's paradigm is useful for examining the uptake and assimilation of ICT breakthroughs in developing nations. The paradigm provides a solid theoretical base, trustworthy empirical support, and potential applications for information systems innovation fields.

Methodology

The study's population is 6,410,159 registered SMEs in Northern Nigeria (SMEDAN, 2023). The study randomly selected the five top states in Northern Nigeria with the highest number of SMEs, namely Kano, Kaduna, Katsina, Niger, and Plateau. SMEs in the study are categorized based on industry.

Northern Nigeria is characterized by a diverse market landscape and varying levels of technological infrastructure, which influences the adoption of E-commerce among businesses. The research takes a quantitative approach using a questionnaire to handle the data

400 small and medium-sized businesses in Northern Nigeria were chosen for the study using the Yaro Yamani formula ($n = N / (1 + N(e^{-2}))$) from a population of 6,410, 159, and 0.05 sampling error. The 400 respondents, who were both managers and owners of SMEs, were chosen using a simple random sample technique. The goal of the study was achieved by using Likert scale rating and descriptive statistics. However, the study's hypothesis was tested using multivariate regression analysis. The following highlights the model specifications for the hypothesis:

Hypothesis Variables

- **Sales Growth (H₀¹):** There is a positive relationship between the extent of E-commerce adoption and the sales growth of SMEs in Northern Nigeria.
- **Market Reach (H₀²):** E-commerce adoption positively impacts the market reach of SMEs in Northern Nigeria.
- **Operational Efficiency (H₀³):** The adoption of E-commerce enhances the operational efficiency of SMEs in Northern Nigeria.
- **Customer Satisfaction (H₀⁴):** SMEs in Northern Nigeria that adopt E-commerce experience higher customer satisfaction compared to those that do not adopt E-commerce.
- **Overall Profitability (H₀⁵):** There is a positive relationship between E-commerce adoption and the overall profitability of SMEs in Northern Nigeria.

Therefore, the general Model $Y = \beta_0 + \beta_1(\text{Sales Growth}) + \beta_2(\text{Market Reach}) + \beta_3(\text{Operational Efficiency}) + \beta_4(\text{Customer Satisfaction}) + \beta_5(\text{Profitability}) + ?$

Y variable (Dependent Variable):

- E-commerce Adoption

X variables (Independent Variables):

- Sales Growth
- Market Reach
- Operational Efficiency
- Customer Satisfaction
- Profitability

Data Analysis and Results

Table 1: E-commerce Adoption among SMEs

E-commerce Adoption Level	Frequency	Percentage
Not Adopted	80	20%
Partially Adopted	120	30%
Fully Adopted	200	50%

Source: Field Survey, (2024)

Data on the degree of e-commerce adoption among SMEs was gathered from 400 SMEs in Northern Nigeria. According to research, 20% of SMEs have not used e-commerce at all. While 50% of SMEs have fully accepted e-commerce, suggesting a sizable fraction of SMEs in Northern Nigeria are adopting online commercial operations, 30% of SMEs have partially adopted e-commerce, implying they are employing some e-commerce techniques but not fully integrated. The study's findings are in line with those of Adebayo, et al. (2020), who discovered that 50% of SMEs have fully embraced e-commerce. These findings are particularly relevant to Northern Nigeria. The study's findings are consistent with those of Kwaku, et al. (2021), who found that 30% of SMEs had only partially embraced e-commerce. These companies, in line with research from Northern Nigeria, used digital marketing and

rudimentary online sales tools but did not fully integrate with sophisticated e-commerce systems. The report underlined the growing trend of digital business practices and the part played by infrastructure advancements and governmental regulations in promoting their adoption.

Table 2: Challenges of E-commerce Adoption

Challenge	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Strongly Agree
Lack of Internet Infrastructure	20	30	50	180	120	3.88
High Cost of Implementation	10	40	60	200	90	3.80
Lack of Technical Skills	30	60	70	160	80	3.45
Security Concerns	25	55	75	150	95	3.58
Resistance to Change	40	60	90	130	80	3.30
Regulatory Issues	50	70	80	140	60	3.18

Source: Field Survey, (2024)

SMEs in Northern Nigeria were asked to rank the challenges to their adoption of e-commerce on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). The mean scores show how much each challenge is thought of. The biggest obstacle, with a mean score of 3.88, was the lack of internet infrastructure, suggesting that many SMEs have trouble getting access to dependable internet services. SMEs in the region are also facing major obstacles to adopting e-commerce, including high implementation costs (3.80), a lack of technical skills (3.45), security concerns (3.58), resistance to change (3.30), and regulatory challenges (3.18). According to Kofi, et al. (2020), the biggest obstacles were a lack of dependable internet infrastructure and expensive deployment. The study's conclusions support the findings, which identify these problems as the main barriers to the adoption of e-commerce. Additionally, Nkurunziza, et al. (2020) found that security concerns and a lack of technological expertise were major obstacles to SMEs' adoption of e-commerce. These results, which highlight the need for improved security measures and skill development, are in line with those from Northern Nigeria.

Table 3: Strategies for Successful E-commerce Adoption

Strategies	Frequency*	Percentage
Improving Internet Infrastructure	300	16.22%
Providing Financial Incentives	280	15.14%
Offering Training and Skill Development	350	18.92%
Enhancing Security Measures	320	17.30%
Promoting Awareness and Benefits	310	16.76%
Simplifying Regulatory Requirements	290	15.68%

Source: Field survey, (2024) *Multiple responses

The frequent approaches that respondents recommended to help SMEs in Northern Nigeria successfully use e-commerce are shown in the table 4. Offering training and skill development (18.92%), enhancing security measures (17.30%), improving internet infrastructure (16.22%), raising awareness and benefits (16.76%), offering financial incentives (15.14%), and streamlining regulatory requirements (15.68%) are strategies found to facilitate the adoption of E-commerce among SMEs in Northern Nigeria. This study's outcome is consistent with that of Martin, et al. (2021), who found that the best way to encourage the adoption of e-commerce was to offer training and skill development. Moreover, strengthening cybersecurity defenses against cyberattacks was found to be a crucial

facilitator, bolstering the idea that SMEs embracing e-commerce need strong cybersecurity. The results of the current study are also supported by the findings of Kumar, et al. (2020), which similarly emphasized the significance of enhancing internet infrastructure as a core driver and raising awareness and teaching SMEs about the advantages of e-commerce as a crucial tactic to boost adoption.

Table 4: Result of the Hypothesis

Coefficient	Estimate	Standard Error	t-Value	p-Value
Intercept (β_0)	0.50	0.20	2.50	0.013
Sales Growth (β_1)	0.25	0.10	2.50	0.013
Market Reach (β_2)	0.30	0.10	3.00	0.003
Operational Efficiency (β_3)	0.20	0.09	2.22	0.027
Customer Satisfaction (β_4)	0.50	0.88	1.38	0.371
Profitability (β_5)	0.40	0.09	4.44	<0.001

Source: Field Survey, (2024)

The multivariate regression analysis revealed that several factors significantly impact overall business performance among SMEs in Northern Nigeria. Sales Growth ($\beta_1 = 0.25, p = 0.013$), Market Reach ($\beta_2 = 0.30, p = 0.003$), Operational Efficiency ($\beta_3 = 0.20, p = 0.027$), and Profitability ($\beta_5 = 0.40, p < 0.001$) all have positive and statistically significant effects on business performance. However, Customer Satisfaction ($\beta_4 = 0.50, p = 0.371$) did not show a significant effect. While customer satisfaction did not show a measurable influence in this particular model, these findings suggest that concentrating on improving sales growth, expanding market reach, improving operational efficiency, and increasing profitability are crucial strategies for enhancing overall business performance in this region.

Findings of John & Smith (2020) align well with the findings of the current research on Northern Nigerian SMEs, who indicated that there is a positive effect of E-commerce adoption on sales growth and market reach. The results are also consistent with those of Lee et al. (2019), who discovered that the implementation of e-commerce streamlines business procedures and lowers transaction costs, resulting in notable enhancements in operational efficiency and profitability. Brown, et al.'s (2018) finding, however, is at odds with recent study on small and medium-sized enterprises (SMEs) in Northern Nigeria, which found no discernible relationship between customer satisfaction and the overall business performance. The disparity can result from geographical disparities in the maturity of e-commerce markets.

Conclusion and Recommendations

Small and medium-sized businesses (SMEs) in Northern Nigeria have embraced e-commerce, which is a big step toward their integration into the global digital economy. Despite the fact that a sizable fraction of SMEs in the area have embraced e-commerce, this survey has shown that many still encounter considerable obstacles. To be more precise, 20% of SMEs have not accepted e-commerce at all, 30% have adopted it slightly, and 50% of SMEs have fully adopted it. The expansion of sales, market reach, operational efficiency, and profitability are all improved when SMEs implement e-commerce. The influence on customer satisfaction is still negligible, though, which suggests more research and focused tactics are required in this area. Inadequate internet infrastructure, high implementation costs, a lack of technological expertise, security concerns, aversion to change, and complicated legislative frameworks are the main obstacles to the widespread adoption of e-commerce.

To tackle these obstacles, a diverse strategy is needed. Important tactics include improving internet infrastructure, giving financial incentives, facilitating skill development and training, improving cybersecurity protocols, raising awareness of the advantages of e-commerce, and streamlining regulatory frameworks. These initiatives have the potential to greatly increase SMEs' e-

commerce adoption rates and efficacy. In conclusion, even though SMEs in Northern Nigeria are progressively adopting e-commerce, more work has to be done by industry players, legislators, and the SMEs themselves to realize e-commerce's full potential. SMEs can use e-commerce to increase their competitiveness, efficiency, and growth by overcoming the obstacles that have been found and putting the suggested ideas into practice. This change is necessary to support Northern Nigeria's business community in building a robust and dynamic environment that will support the region's overall economic growth and integration into the global digital economy.

The findings lead to the following recommendations being put forth:

- a. Governments should put plans in place to target SMEs who have not yet embraced e-commerce and assist those who have to completely integrate online commercial operations. This will encourage SMEs to adopt e-commerce more widely.
- b. Policy makers and government bodies should strengthen technological capabilities, lower implementation costs, improve internet infrastructure, handle security issues, and simplify regulatory requirements in order to overcome obstacles to SMEs' adoption of e-commerce.
- c. It is advised that governmental and non-governmental organizations provide training and skill development, strengthen security protocols, upgrade internet infrastructure, increase benefit awareness, offer financial incentives, and simplify regulatory requirements in order to encourage SMEs to adopt e-commerce.
- d. In order to improve their overall business performance, SMEs should give priority to tactics that increase sales growth, penetrate new markets, and improve operational efficiency.

Contribution to Knowledge

In conclusion, this study adds to our understanding of the theoretical and practical aspects of Small and Medium Enterprises adoption of e-commerce by providing insightful analysis, recommendations based on solid evidence, and a framework for further study and policy development targeted at hastening digital transformation in Northern Nigeria and beyond.

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