

ENTREPRENEURSHIP AND DIGITAL INNOVATION: DRIVING SMALL AND MEDIUM SCALE ENTERPRISES GROWTH IN NIGER DELTA REGION

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ABSTRACT

This study examined the role of entrepreneurship and digital innovation in driving the growth of small and medium-scale enterprises (SMEs) in the Niger Delta region of Nigeria. Recognizing SMEs as critical engines of employment generation, income creation, and regional economic diversification, the study investigates how key entrepreneurial and digital drivers stimulate enterprise expansion across the eight Niger Delta states—Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, and Rivers. The population comprised 12,480 SME operators, from which a sample size of 388 respondents was determined using the Taro-Yamane method. Specifically, the study evaluated the effects of the number of digital start-ups, access to venture capital, e-commerce adoption, and fintech loans on SME growth. Data were collected using a structured instrument titled Entrepreneurship and Digital Innovation Questionnaire (EDIQ). Descriptive statistics, including tables, charts, and frequencies, were employed to address the research questions, while the multiple regression was used to test the hypotheses with the aid of SPSS version 26. The findings reveal that the number of digital start-ups, access to venture capital, and e-commerce adoption have positive and statistically significant relationships with SME growth in the region. Although fintech loans showed a positive association, the relationship was statistically insignificant. The study concludes that entrepreneurship and digital innovation are critical catalysts for SME growth in the Niger Delta and recommends institutional support for structured startup promotion and digital ecosystem development.

Keywords: *Number of Start-Ups, Access to Venture Capital, E-commerce Adoption, fintech Loans, Small and Medium Scale Enterprises Growth.*

Introduction

Small and Medium Scale Enterprises have become indispensable to economic growth because of their contributions to employment generation, income creation, poverty reduction, innovation, and industrial development. Across developed and developing economies, Small and Medium

Scale Enterprises constitute the largest proportion of business establishments and serve as catalysts for entrepreneurship and technological advancement. In Nigeria, where economic diversification has become a national priority, the growth and sustainability of Small and Medium Scale Enterprises depend largely on the

entrepreneurial capabilities of business owners and their ability to embrace digital innovations that enhance productivity and competitiveness. Therefore, entrepreneurship has been described as the process of identifying business opportunities, mobilizing resources, and introducing innovative ideas to create value and achieve organizational growth. According to Ratten (2020), entrepreneurship involves recognizing opportunities and utilizing innovation to develop sustainable enterprises capable of creating economic and social value. Similarly, Hisrich et al (2020) defined entrepreneurship as the process of creating something new with value through the commitment of time, effort, and resources while assuming the associated financial and social risks. In the same vein, digital innovation refers to the application of digital technologies to develop new products, services, business processes, and business models that improve organizational performance. Nambisan, et al (2017) viewed digital innovation as the integration of digital technologies into organizational activities to create new value, while the Organisation for Economic Co-operation and Development (OECD, 2023) described it as the use of digital technologies to generate significant improvements in products, services, production processes, and organizational efficiency.

Entrepreneurship and digital innovation have become major drivers of Small and Medium Scale Enterprises development by enhancing productivity, improving operational efficiency, facilitating market expansion, strengthening customer relationships, and increasing business resilience. Entrepreneurs who leverage digital technologies such as e-commerce platforms, digital payment systems, cloud

computing, mobile applications, and social media marketing are better positioned to compete in dynamic markets and achieve sustainable growth. In the Niger Delta Region, where Small and Medium Scale Enterprises play a significant role in commerce, agriculture, manufacturing, hospitality, and services, digital innovation has created opportunities for enterprises to overcome geographical barriers, access wider markets, reduce transaction costs, and improve service delivery despite prevailing infrastructural challenges. It is therefore imperative to note that recent statistical data support this view. Take for instance, the Development Bank of Nigeria, using SMEDAN data, reports that Nigeria has about 39.7 million MSMEs, employing approximately 49.2 million people and contributing substantially to national output. Furthermore, recent evidence indicates that MSMEs contribute about 46.3% of Nigeria's Gross Domestic Product (GDP) and approximately 87.9% of formal employment, highlighting their strategic importance to national economic development. Consequently, it is important to note that Small and Medium Scale Enterprises in the Niger Delta Region are expected to operate in an environment where entrepreneurial competencies are continuously strengthened and digital technologies are effectively integrated into business operations to improve productivity, innovation, profitability, and long-term sustainability. Such enterprises should possess the capacity to exploit emerging business opportunities, adapt to technological changes, compete effectively in local and global markets, and contribute significantly to regional and national economic development. However, the reality differs considerably from this expectation.

Despite the economic significance of Small and Medium Scale Enterprises, many enterprises in the Niger Delta continue to experience slow growth, low productivity, weak digital adoption, inadequate innovation capacity, poor infrastructure, limited access to finance, and an unfavourable business environment. The region is further confronted with environmental degradation, insecurity, and the adverse effects of militancy, which continue to undermine entrepreneurial activities and enterprise sustainability. Moreover, Nigeria's MSME sector is estimated to face a financing gap of about US\$32.2 billion, while only about 4% of firms have access to formal bank credit, limiting investment in innovation and digital transformation. Although previous empirical studies have established positive relationships between entrepreneurship, innovation, digital technology, and SME performance, existing studies have produced varying findings regarding the magnitude and consistency of these relationships across sectors and locations. In addition, most previous studies focused on entrepreneurship or digital innovation independently, while relatively few have examined their combined influence on Small and Medium Scale Enterprises, particularly within the unique socio-economic and business environment of the Niger Delta Region. This represents an important contextual and geographical gap in the literature. Based on this gap the study is motivated to examine how entrepreneurship and digital innovation jointly drive the growth and development of small and medium scale enterprises in the Niger Delta Region.

Aim of the study

The aim of this study is to investigate the impact of Entrepreneurship

and Digital Innovation on Small and Medium Scale Enterprises Growth in Niger Delta Region. Specifically, the paper seeks to;

- i. Investigate how number of digital start-ups enhance small and medium scale enterprises in Niger delta region.
- ii. Examine the impact of access to venture capital on small and medium scale enterprises in Niger delta region.
- iii. Evaluate the impact of e-commerce on small and medium scale enterprises in Niger delta region.
- iv. Analyze how fintech loans improve small and medium scale enterprises in Niger delta region.

Research Question

The following research questions were formulated to guide the study

- i. How has number of start-ups enhanced small and medium scale enterprises in Niger delta region?
- ii. To what extent has access to venture capital improved small and medium scale enterprises in Niger delta region?
- iii. How has e-commerce influenced small and medium scale enterprises in Niger delta region?
- iv. To what extent has fintech loan small and medium scale enterprises in Niger delta region?

Hypothesis

The following hypothesis were formulated in null form to guide the study

H₀₁: There is no significant relationship between number of start-ups and small and medium scale enterprises in Niger delta region.

H₀₂: There is no significant relationship between access to venture capital and small and medium scale enterprises in Niger delta region.

H03: There is no significant relationship between e-commerce and sand mall and medium scale enterprises in Niger delta region.

H04: There is no significant relationship between fintech loan and small and medium scale enterprises in Niger delta region.

Significance of the Study

The study is highly significant to the Niger Delta Development Commission (NDDC) as it provides empirical evidence that startup development, venture capital access, and e-commerce expansion significantly drive the growth of small and medium-scale enterprises (SMEs). This insight will enable the Commission to design targeted entrepreneurship intervention programs, digital innovation hubs, and structured venture funding schemes aimed at stimulating inclusive economic growth and reducing youth unemployment across the Niger Delta states. The findings are equally relevant to the Ministry of Niger Delta Affairs, as they offer policy-oriented guidance on how strengthening startup ecosystems and improving access to digital markets can enhance regional productivity. The Ministry can leverage this evidence in developing strategic frameworks that promote innovation clusters and strengthen digital infrastructure in oil-producing communities.

The Small and Medium Enterprises Development Agency of Nigeria (SMEDAN) will benefit from the study by gaining data-driven insights into the importance of venture capital and startup proliferation in SME expansion. The agency can refine its enterprise development programs by integrating structured venture financing models and entrepreneurship incubation support tailored to SMEs in the Niger Delta region. The study is also significant to the Bank of Industry (BOI), as

the positive relationship between venture capital access and SME growth highlights the need for improved financing frameworks. The Bank can use these findings to expand blended finance initiatives, reduce collateral constraints, and partner with private investors to deepen SME funding penetration within the region.

Furthermore, the results provide strategic implications for the Central Bank of Nigeria (CBN). The insignificant relationship between fintech loans and SME growth suggests the need for stronger regulatory oversight, improved risk assessment mechanisms, and financial literacy programs to enhance the effectiveness of digital lending platforms. The CBN can strengthen supervisory frameworks to ensure fintech credit translates into measurable enterprise expansion. The National Information Technology Development Agency (NITDA) will find this study particularly useful because of the strong impact of e-commerce on SME growth. The agency can intensify digital literacy campaigns, cybersecurity awareness programs, and ICT infrastructure development in rural and semi-urban areas of the Niger Delta to further harness digital trade opportunities. Academic and research institutions such as the Niger Delta University and other regional universities will benefit from this study as it contributes to the existing body of knowledge on entrepreneurship finance and digital transformation. The findings provide a foundation for further empirical investigations, model extensions, and comparative regional analyses, thereby enriching scholarly discourse on SME development in resource-dependent economies.

Finally, independent researchers and policy analysts in Nigeria will find the study

valuable as it offers contemporary empirical evidence linking startup dynamics, venture capital, fintech finance, and digital commerce to enterprise performance. It opens new avenues for future research on innovation financing, digital inclusion, and sustainable regional development strategies, particularly within emerging economies such as those in the Niger Delta.

Literature Review

Conceptual Literature

Entrepreneurship

Entrepreneurship has emerged as one of the most influential concepts in contemporary economic and business literature because of its profound contribution to innovation, job creation, wealth generation, poverty reduction, and sustainable economic development. According to Schumpeter (1934), entrepreneurship is the process of introducing new combinations of resources through innovation by developing new products, new methods of production, new markets, new sources of supply, and new forms of business organization. Schumpeter argued that entrepreneurs serve as agents of economic development by disrupting existing market structures through innovation. Similarly, Drucker (1985) defined entrepreneurship as the practice of systematically searching for change, responding to it, and exploiting it as an opportunity to create value. Drucker emphasized that entrepreneurship is rooted in innovation and the effective utilization of opportunities rather than merely establishing new businesses. Accordingly, Stevenson (1983) viewed entrepreneurship as the pursuit of opportunity beyond the resources currently controlled.

According to Kirzner (1973), entrepreneurship is the ability to discover and exploit previously unnoticed market

opportunities. Kirzner maintained that entrepreneurs possess exceptional alertness that enables them to recognize market imperfections and transform them into profitable ventures. Likewise, Paul (2020) described entrepreneurship as a multidimensional process involving opportunity identification, resource mobilization, innovation, decision-making, and strategic business development aimed at creating value and promoting economic growth. They argued that entrepreneurship extends beyond business creation to include entrepreneurial behaviour and value creation. Equally, Lukman et al (2023) observed that entrepreneurship is a dynamic concept encompassing the identification and exploitation of opportunities to create economic and social value through innovation, enterprise creation, and effective resource utilization. Entrepreneurship plays an indispensable role in both developed and developing economies. It stimulates innovation, increases productivity, enhances competitiveness, creates employment opportunities, promotes industrialization, improves income distribution, and contributes significantly to gross domestic product. In developing countries such as Nigeria, entrepreneurship has become a major policy instrument for addressing youth unemployment, poverty, economic diversification, and overdependence on the public sector. For the purpose of this study, entrepreneurship is conceptualized as the process through which individuals identify and exploit business opportunities, mobilize and coordinate resources, introduce innovations, assume calculated risks, and establish or expand business ventures that generate employment, create wealth, and contribute to sustainable economic development.

Digital Innovation

Digital innovation has become a defining force in today's knowledge-driven economy, transforming how businesses, governments, and societies create value, deliver services, and achieve sustainable development. The unprecedented advancement of digital technologies such as artificial intelligence, cloud computing, big data analytics, blockchain, mobile technologies, the Internet of Things, and digital platforms has fundamentally changed organizational processes, business models, and customer interactions. As organizations strive to remain competitive in an increasingly digital environment, digital innovation has emerged as a critical capability for enhancing productivity, improving operational efficiency, fostering creativity, and sustaining competitive advantage. According to Yoo, et al (2010), digital innovation refers to the creation of new products, services, business processes, or organizational practices through the application and recombination of digital technologies. The expert argued that the programmable and flexible characteristics of digital technologies provide organizations with continuous opportunities to innovate and adapt to changing market conditions. Similarly, Nambisan, et al (2017) defined digital innovation as the development of new products, services, processes, or business models that are enabled or significantly enhanced through the application of digital technologies. They emphasized that digital innovation extends beyond technological adoption to encompass organizational transformation, collaborative value creation, and new approaches to innovation management.

Urbach and Röglinger (2019) viewed digital innovation as a continuous organizational process through which digital

technologies are strategically deployed to improve business operations, enhance customer value, increase organizational performance, and create sustainable competitive advantage. According to Urbach and Röglinger (2019) successful digital innovation requires organizations to continuously adapt their structures, capabilities, and strategies to emerging technological developments. The Organisation for Economic Co-operation and Development (OECD, 2023) described digital innovation as the application of digital technologies to develop new or significantly improved products, services, production methods, and organizational processes that enhance productivity, competitiveness, and economic growth. The OECD further emphasized that digital innovation contributes significantly to sustainable development through improved efficiency and increased value creation across economic sectors. David-West. (2021) observed that digital innovation has become a major driver of business transformation in Nigeria, particularly through the adoption of financial technology, digital platforms, and emerging technologies that improve business efficiency, financial inclusion, and customer experience. From the foregoing definitions, digital innovation can be understood as a continuous process through which organizations and individuals employ digital technologies to develop new products, improve existing services, redesign operational processes, and establish innovative business models that generate value for customers and society. It is therefore not merely the acquisition of digital technologies but their strategic application in solving problems, improving organizational performance, and creating competitive advantage. For the purpose of

this study, digital innovation is conceptualized as the continuous application and integration of digital technologies to develop or improve products, services, operational processes, and business models in ways that enhance organizational efficiency, competitiveness, value creation, and sustainable economic development.

Small and Medium Scale Enterprises

Small and Medium Scale Enterprises have increasingly become the cornerstone of economic development across both developed and developing economies due to their significant contribution to employment generation, innovation, industrialization, poverty reduction, and wealth creation. In today's highly competitive and dynamic business environment, Small and Medium Scale Enterprises serve as engines of entrepreneurship by promoting local production, enhancing productivity, and stimulating inclusive economic growth. According to Organisation for Economic Co-operation and Development (2019), small and medium enterprises are independent business establishments that operate with relatively few employees and limited financial resources when compared with large-scale enterprises. The Organisation for Economic Co-operation and Development (2019) emphasized that although the criteria for classifying Small and Medium Scale Enterprises differ across countries, they remain important drivers of innovation, productivity, and employment. Similarly, World Bank (2020) defined small and medium enterprises as formally registered businesses that employ relatively small numbers of workers and operate with moderate levels of assets and annual turnover. The World Bank maintained that Small and Medium Scale Enterprises play a critical role in expanding economic opportunities, supporting private sector

development, and reducing poverty in developing economies.

Consequently, the Small and Medium Enterprises Development Agency of Nigeria (2021) defines a small enterprise as a business employing 10 to 49 employees with assets valued between ₦5 million and less than ₦50 million, excluding land and buildings. A medium enterprise is defined as a business employing 50 to 199 employees with assets ranging from ₦50 million to less than ₦500 million, excluding land and buildings. This classification has become the most widely adopted definition of Small and Medium Scale Enterprises in Nigeria for research and policy purposes. The Central Bank of Nigeria (2005) described small and medium enterprises as business organizations operating with relatively limited capital investment and workforce but possessing significant potential for employment creation, industrial development, and economic growth. The Bank emphasized that Small and Medium Scale Enterprises constitute an important segment of Nigeria's productive sector by facilitating domestic production and private sector expansion. According to Small and Medium Enterprises Development Agency of Nigeria and the National Bureau of Statistics (2017), Small and Medium Scale Enterprises constitute the largest proportion of business establishments in Nigeria and contribute substantially to employment generation, income creation, entrepreneurship development, and national output. The report further noted that Small and Medium Scale Enterprises remain fundamental to achieving inclusive economic growth and sustainable development.

From the foregoing definitions, small and medium scale enterprises can be conceptualized as independently owned and

managed business establishments that operate within specified employment and asset thresholds, utilize relatively limited resources, and engage in productive activities aimed at creating goods and services, generating profits, creating employment opportunities, and contributing to national economic development. Although the numerical classification of Small and Medium Scale Enterprises varies across countries, the fundamental characteristics remain similar, namely relatively small operational size, independent ownership, managerial flexibility, innovation, and growth potential. Small and medium scale enterprises perform numerous economic and social functions within both developed and developing economies. They promote entrepreneurship by providing opportunities for individuals to establish and expand businesses, thereby reducing unemployment and improving household incomes. Small and Medium Scale Enterprises also stimulate innovation through the introduction of new products, production techniques, and business practices that enhance competitiveness. Furthermore, they contribute significantly to industrialization by serving as suppliers, distributors, and subcontractors to large organizations while strengthening domestic value chains.

Theoretical Literature

Innovation Diffusion Theory

The Innovation Diffusion Theory was developed by Rogers (1962) to explain how innovations are introduced, communicated, and adopted within a social system over time. The theory posits that the adoption of an innovation is a gradual process influenced by the characteristics of the innovation, communication channels, time, and the social system in which the innovation is introduced. Rogers (2003)

argued that innovations are more likely to be adopted when they possess a clear relative advantage over existing practices, are compatible with users' values and needs, are easy to understand and use, can be tested on a limited basis, and have observable benefits. Rogers (1962) further classified adopters into innovators, early adopters, early majority, late majority, and laggards, emphasizing that the rate of innovation adoption varies across individuals and organizations. The theory has received considerable support from scholars who argue that it provides a robust framework for explaining the adoption of technological innovations across different sectors. For instance, Tornatzky and Klein (1982) maintained that the attributes identified by Rogers significantly influence innovation adoption decisions, while Nambisan, Lyytinen, Majchrzak, and Song (2017) argued that the theory remains relevant in explaining the adoption of digital technologies and digital innovation within modern organizations. These scholars contend that organizations are more likely to embrace digital innovations when such technologies offer superior value, improve efficiency, and enhance organizational performance.

Despite its widespread acceptance, the theory has attracted criticism from several scholars. Abrahamson (1991) argued that the theory assumes organizations adopt innovations primarily because of their perceived advantages, whereas institutional pressures, competitive forces, and managerial trends often influence adoption decisions. Similarly, Greenhalgh, et al (2004) contended that the theory pays insufficient attention to contextual factors such as organizational resources, government policies, financial constraints, and infrastructure, all of which may

facilitate or hinder innovation adoption, particularly in developing economies. Notwithstanding these criticisms, the theory is considered the most appropriate theoretical framework for this study because it provides a comprehensive explanation of how entrepreneurship and digital innovation influence the growth and development of small and medium scale enterprises. The theory explains the process through which entrepreneurs recognize, evaluate, adopt, and utilize digital technologies to improve business operations, expand market access, enhance customer satisfaction, and strengthen enterprise competitiveness. Since the study examines how entrepreneurship and digital innovation drive the performance of small and medium scale enterprises in the Niger Delta Region, the theory provides a sound basis for understanding why some enterprises readily adopt digital innovations while others remain reluctant. Consequently, the theory was adopted to anchor this study because its fundamental assumptions align with the study's variables and clearly explain the role of digital innovation in enhancing the sustainability, competitiveness, and growth of small and medium scale enterprises.

Resource-Based View Theory

The Resource-Based View theory was first introduced by Wernerfelt (1984) and was subsequently expanded by Barney (1991). The theory explains that an organization's ability to achieve superior performance and sustain competitive advantage depends largely on the effective acquisition, development, and utilization of its internal resources and capabilities. According to Wernerfelt (1984), firms should be viewed as bundles of tangible and intangible resources whose strategic deployment determines organizational success. Barney (1991) further argued that

resources can only provide sustainable competitive advantage when they are valuable, rare, inimitable, and non-substitutable. These resources include entrepreneurial knowledge, managerial competence, technological capabilities, innovation capacity, organizational culture, and human capital, which collectively enable firms to outperform competitors. The theory has received considerable support from scholars who regard it as one of the most influential theories in strategic management. Peteraf (1993) argued that firms possessing unique and difficult-to-imitate resources are more likely to achieve sustained superior performance than firms that rely solely on external market conditions. Similarly, Barney, Ketchen, and Wright (2011) maintained that organizational capabilities, innovation, knowledge, and entrepreneurial competencies constitute strategic resources that enhance firm productivity, competitiveness, and long-term growth. These scholars emphasized that firms capable of effectively combining their resources with innovative capabilities are better positioned to adapt to changing business environments and achieve sustainable success.

Despite its popularity, the theory has been criticized by several scholars. Priem and Butler (2001) argued that the theory is largely static because it pays greater attention to existing organizational resources while giving insufficient consideration to external environmental factors such as competition, technological change, government policies, and market dynamics. Likewise, Eisenhardt and Martin (2000) contended that the Resource-Based View does not adequately explain how firms continuously renew and reconfigure their resources in rapidly changing environments.

They argued that competitive advantage depends not only on possessing valuable resources but also on developing dynamic capabilities that enable organizations to respond effectively to environmental changes. Notwithstanding these criticisms, the Resource-Based View provides a suitable theoretical foundation for this study because it explains how entrepreneurship and digital innovation function as strategic organizational resources capable of enhancing the performance of small and medium scale enterprises. Entrepreneurial skills, innovative capabilities, digital technologies, managerial competence, and organizational knowledge represent valuable resources that enable SMEs to improve operational efficiency, increase productivity, strengthen customer relationships, and achieve sustainable competitive advantage. Since this study examines how entrepreneurship and digital innovation drive the growth and development of small and medium scale enterprises in the Niger Delta Region, the Resource-Based View offers a logical explanation of how internal capabilities influence enterprise performance. Consequently, the theory was adopted as a supporting theoretical framework because it demonstrates that SMEs possessing strong entrepreneurial orientation and digital innovation capabilities are more likely to achieve sustainable growth, improved competitiveness, and long-term business success than enterprises with limited strategic resources.

Empirical Literature

Ashiru et al (2023) investigated the influence of emerging digital communication technologies (EDCTs) on the resilience of small and medium-sized enterprises in Nigeria during the COVID-19 pandemic. Specifically, the study examined

emerging digital communication technologies as the independent variable and SME resilience as the dependent variable. SME resilience was assessed through firms' adaptability, operational continuity, and recovery capability. The study adopted a quantitative research design using survey data collected from SME owners and managers in Nigeria. The responses were analysed using Structural Equation Modelling (SEM). The empirical findings revealed that emerging digital communication technologies had a positive and statistically significant effect on small and medium-sized enterprises resilience. The study further established that digital technologies enhanced firms' ability to maintain customer relationships, coordinate internal operations, respond quickly to market changes, and improve decision-making.

Ilyas, et al (2023) examined the determinants of digital entrepreneurial acceptance among small and medium-sized enterprises (SMEs) in Pakistan. A quantitative survey design was adopted, and data were collected from 200 SME respondents. The hypotheses were tested using Structural Equation Modelling (SEM). The findings showed that perceived usefulness had a positive and significant effect on digital entrepreneurial acceptance. Perceived ease of use also exerted a positive and significant influence. Similarly, attitude toward technology and behavioural intention had positive and significant effects on digital entrepreneurial acceptance. Among the DIY variables, most dimensions significantly enhanced digital entrepreneurial acceptance, although perceived lack of product quality and perceived lack of product availability were not statistically significant.

Cunningham, et al (2023) investigated the relationship between

technology adoption, entrepreneurial mindset, and value creation among micro, small and medium-sized enterprises (MSMEs). The study examined opportunity recognition, entrepreneurial mindset, organizational factors, and environmental factors as the explanatory variables, while technology adoption and value creation served as the outcome variables. The study employed a configurational research design using fuzzy-set Qualitative Comparative Analysis (fsQCA). The findings revealed that opportunity recognition was a necessary and significant condition for technology adoption among MSMEs. Furthermore, the combination of entrepreneurial mindset, organizational support, and favourable environmental conditions significantly enhanced technology adoption and value creation. Additionally, Jing, et al (2023) investigated the effect of digital ambidextrous capabilities on the transformation performance of SMEs in China. The study examined digital exploration capability and digital exploitation capability as the independent variables, business model innovation as the mediating variable, and SME transformation performance as the dependent variable. Data were collected from 289 managers of Chinese SMEs, and the researchers analysed the data using Structural Equation Modelling (SEM) and fuzzy-set Qualitative Comparative Analysis (fsQCA). The results showed that digital exploration capability had a positive and significant effect on driving-market business model innovation, while digital exploitation capability had a positive and significant effect on market-driven business model innovation. The study further established that business model innovation fully mediated the relationship between digital ambidextrous capabilities and SME transformation performance.

Nasiri, et al (2023) investigated the digital-related capabilities that shape digital innovation opportunities among SMEs in Finland. The study examined human capability, collaboration capability, technical capability, and innovation capability as the independent variables, while digital innovation which was measured through digital market offerings and digital business process innovation served as the dependent variable. A quantitative survey design was adopted, and data were collected from 280 SMEs in the manufacturing and service sectors. The study employed Partial Least Squares Structural Equation Modelling (PLS-SEM) for data analysis. The empirical results showed that human capability had a positive and significant effect on digital market technical capability also exerted a positive and significant influence on both dimensions of digital innovation by enabling firms to adopt and integrate digital technologies effectively. Furthermore, innovation capability positively and significantly affected digital market offerings, while collaboration capability had a positive and significant effect on digital business process innovation, demonstrating that partnerships and knowledge sharing facilitate digital transformation.

Rodrigues, et al (2022) examined how digitalisation and innovation contribute to the development of digital entrepreneurship among small and medium-sized enterprises (SMEs) in Portugal. The study investigated digitalisation and innovation as the independent variables, while digital entrepreneurship was measured through operational efficiency, customer relations, and employee behavior served as the dependent variable. A quantitative survey research design was adopted, and data were collected from SME managers

through structured questionnaires. The hypotheses were tested using Structural Equation Modelling (SEM). The empirical findings indicated that digitalisation had a positive and statistically significant effect on digital entrepreneurship. Similarly, innovation exerted a positive and significant influence on digital entrepreneurship. The study further showed that the combined effect of digitalisation and innovation significantly improved operational efficiency, strengthened customer relationships, and promoted positive employee behaviour within SMEs. Likewise, Troise et al (2022) examined the relationship between digital technologies, entrepreneurial orientation, and SME innovation performance. Specifically, the study investigated digital technology adoption, entrepreneurial orientation, absorptive capacity, and knowledge management capability as the independent variables, while innovation performance served as the dependent variable. The study employed a quantitative survey design involving SMEs operating in several European countries. The hypotheses were tested using Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings indicated that digital technology adoption had a positive and significant effect on innovation performance. Entrepreneurial orientation also exerted a positive and significant influence by encouraging innovation, proactiveness, and opportunity exploitation. Furthermore, absorptive capacity positively and significantly enhanced innovation performance. Similarly, knowledge management capability significantly improved innovation outcomes.

Verhoef, et al (2021) examined the determinants of digital transformation and organisational performance. The study

investigated digital technologies, digital capability, organisational resources, innovation capability, and leadership commitment as the independent variables, while firm performance and digital transformation success were the dependent variables. The study adopted a comprehensive empirical and conceptual approach based on evidence from organisations implementing digital transformation initiatives. The findings revealed that digital capability had a positive and significant influence on digital transformation, while innovation capability significantly improved organisational competitiveness. The study further established that leadership commitment positively influenced successful digital transformation. Moreover, organisational resources significantly strengthened firms' ability to exploit digital technologies, thereby improving business performance. Accordingly, Ardito et al (2021) investigated the influence of digital orientation and environmental orientation on the innovation performance of small and medium-sized enterprises (SMEs) in North America. Specifically, the study examined digital orientation and environmental orientation as the independent variables, while product innovation performance and process innovation performance served as the dependent variables. The study adopted a quantitative cross-sectional research design and collected data from 369 SMEs. The hypotheses were tested using multivariate regression analysis. The findings revealed that digital orientation had a positive and statistically significant effect on product innovation performance. Likewise, digital orientation exerted a positive and significant effect on process innovation performance. Furthermore, environmental orientation had a positive and

significant influence on both product and process innovation performance. However, the study found that the combined interaction between digital orientation and environmental orientation had a negative and significant effect on process innovation performance, while its effect on product innovation performance was not statistically significant.

Scuotto et al (2021) investigated the influence of individual digital capabilities on the growth and innovation performance of labour-intensive SMEs in Europe. The study specifically examined information capability, communication capability, and software capability as the principal dimensions of individual digital capabilities (independent variables), while SME growth and innovation performance served as the dependent variables. The study employed a quantitative research design using secondary data obtained from 2,156,360 European SMEs, and the hypotheses were tested using multiple regression analysis. The empirical findings revealed that information capability had a positive and statistically significant effect on SME growth. Communication capability also had a positive and significant influence on firm growth. Likewise, software capability exerted a positive and significant effect on innovation performance. Also, Scuotto, et al (2021) examined the contribution of individual digital capabilities to the growth of small and medium-sized enterprises (SMEs) during the digital transformation era. The study investigated digital skills, information technology capability, communication capability, and software capability as the principal independent variables, while SME growth and innovation performance constituted the dependent variables. The study analysed a large dataset comprising over 2.1 million European SMEs using econometric

modelling to evaluate the relationships among the variables. The empirical findings demonstrated that digital skills had a positive and statistically significant effect on SME growth. Information technology capability also exerted a positive and significant influence on innovation performance. In addition, communication capability positively and significantly affected SME growth. Likewise, software capability significantly enhanced both innovation performance and firm growth, allowing SMEs to improve productivity, service delivery, and customer satisfaction.

Nadkarni and Prügl (2021) examined digital technologies, organizational capabilities, leadership, business model innovation, and dynamic capabilities as the principal explanatory factors influencing digital transformation and organizational performance. The study adopted a systematic literature review methodology by synthesizing evidence from leading management and innovation journals. The review established that digital technologies positively influence organizational performance when integrated with appropriate organizational capabilities. Dynamic capabilities were found to have a positive and significant influence on firms' ability to sense opportunities, seize market changes, and reconfigure resources. Furthermore, leadership commitment significantly enhanced digital transformation initiatives through strategic direction and resource allocation. The study also found that business model innovation positively contributed to competitive advantage, enabling firms to create new value propositions and improve customer engagement.

Kraus, et al (2021) reviewed the state of digital transformation research with emphasis on business organizations,

including SMEs. The study investigated digital technologies, business process transformation, organizational innovation, digital business models, and technology adoption as the major explanatory themes influencing digital transformation and business competitiveness. The study employed a systematic literature review and bibliometric analysis, synthesizing 39 highly cited studies selected from the Scopus database. The findings showed that digital technology adoption positively influences organizational competitiveness. Business process transformation was identified as having a positive effect on organizational performance. Similarly, organizational innovation significantly enhanced firms' ability to respond to environmental changes and exploit emerging market opportunities. The review further established that digital business models positively contribute to sustainable competitive advantage, while technology adoption serves as the foundation for successful digital transformation.

Becker and Schmid (2020) investigated the design and implementation of digital business strategies among small and medium-sized enterprises (SMEs) and large-scale enterprises (LSEs). The study specifically examined digital strategy, digital leadership, employee digital competence, digital culture, and information technology infrastructure as the independent variables, while successful digital transformation served as the dependent variable. The study. The findings revealed that digital strategy had a positive and significant effect on successful digital transformation. Digital leadership also exerted a positive and significant influence, as committed leadership enhanced the implementation of digital initiatives. Furthermore, employee digital competence

positively and significantly affected digital transformation. Digital culture significantly encouraged innovation and organizational adaptability, while information technology infrastructure positively supported the implementation of digital business strategies.

Eller, et al (2020) examined the antecedents, consequences, and challenges of digitalization among small and medium-sized enterprises (SMEs). The study employed a quantitative research design using survey data collected from SMEs operating in Austria. The data were analysed using Structural Equation Modelling (SEM). The findings revealed that information technology infrastructure had a positive and significant effect on small and medium-sized enterprises. Management support also had a positive and significant influence on digitalization by facilitating resource allocation and strategic commitment. However, digital strategy and employee digital skills, when considered independently, did not have a statistically significant direct effect on financial performance. Instead, the study found that digitalization itself had a positive and significant effect on financial performance and mediated the relationship between information technology infrastructure and firm performance.

Ashrafi, et al (2019) examined the influence of digital business strategy on the performance of small and medium-sized enterprises. The study specifically investigated the effects of digital business strategy, digital capability, innovation capability, customer orientation, and environmental dynamism as the independent variables, while SME performance served as the dependent variable. The study adopted a quantitative research design involving SMEs from different industries, and data were

analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings revealed that digital business strategy had a positive and statistically significant effect on small and medium-sized enterprises performance, Digital capability also exerted a positive and significant influence, on small and medium-sized enterprises. Furthermore, innovation capability positively and significantly affected small and medium-sized enterprises performance.

Kraus, et al (2019) investigated the impact of digital transformation on entrepreneurship and small business management. The study examined digital technologies, entrepreneurial capability, business model innovation, digital platforms, and strategic flexibility as the independent variables, while SME growth and business performance served as the dependent variables. The study employed a systematic review of empirical and theoretical studies relating to entrepreneurship and digital transformation. The findings demonstrated that digital technologies positively influenced SME growth by creating new entrepreneurial opportunities and improving operational efficiency. Entrepreneurial capability significantly enhanced business performance. In addition, business model innovation positively affected competitiveness. Digital platforms significantly facilitated market expansion and customer engagement, while strategic flexibility strengthened firms' ability to respond to changing market conditions.

Cenamor et al (2019) examined how digital platform capability influences the growth and competitiveness of small and medium-sized enterprises (SMEs). The study investigated the effects of digital platform capability, network capability, and

service innovation capability (independent variables) on SME growth and competitive performance. The research adopted a quantitative design using survey data collected from technology-oriented SMEs operating in Sweden. The data were analysed using Structural Equation Modelling. The findings showed that digital platform capability had a positive and statistically significant effect on small and medium-sized enterprises growth, Network capability also exhibited a positive and significant influence on small and medium-sized enterprises performance. Furthermore, service innovation capability positively and significantly affected small and medium-sized enterprises competitiveness, indicating that firms capable of introducing innovative digital services experienced higher customer satisfaction and improved business performance.

Ashrafi et al (2019) investigated the influence of business analytics capabilities on organisational agility and firm performance. Specifically, the study examined business analytics capability (independent variable), information quality and innovative capability (mediating variables), environmental turbulence and firm agility and firm performance (dependent variables). The study adopted a quantitative research design involving 154 firms, with responses obtained from both the Chief Executive Officer (CEO) and Chief Information Officer (CIO) of each firm. The study analysed the data using Partial Least Squares Structural Equation Modelling (PLS-SEM). The result revealed that business analytics capability had a positive and significant effect on information quality. Business analytics capability also exerted a positive and significant influence on innovative capability. Furthermore, information quality positively and

significantly enhanced firm agility, while innovative capability also had a positive and significant effect on organisational agility. The study further established that firm agility significantly improved firm performance, and both market turbulence and technological turbulence strengthened the positive relationship between organisational agility and performance.

Li, et al (2018) examined the role of digital technologies in stimulating entrepreneurial innovation and improving the performance of small and medium-sized enterprises (SMEs) in China. Specifically, the study investigated digital technology adoption, entrepreneurial orientation, innovation capability, and knowledge integration as the independent variables, while SME innovation performance was the dependent variable. The study adopted a quantitative research design using survey data obtained from Chinese SMEs. The study analysed the data using Structural Equation Modelling (SEM). The findings revealed that digital technology adoption had a positive and statistically significant effect on SME innovation and performance, Entrepreneurial orientation also exhibited a positive and significant influence on innovation performance. Furthermore, innovation capability significantly enhanced SME innovation and performance, while knowledge integration positively and significantly strengthened the relationship between digital technology adoption and innovation performance.

Gaps and Value Addition

The empirical literature provides substantial evidence that entrepreneurship and digital innovation have become important drivers of Small and Medium Scale Enterprises growth, competitiveness, resilience, and sustainability across both developed and developing economies.

Existing studies generally agree that the adoption of digital technologies, innovation capabilities, entrepreneurial orientation, digital transformation strategies, and information technology infrastructure significantly improve business performance and create new opportunities for SMEs. For instance, Ashiru et al. (2023) found that emerging digital communication technologies significantly enhanced the resilience of Nigerian SMEs by improving operational continuity, adaptability, customer relationship management, and decision-making during the COVID-19 pandemic. Similarly, Ilyas et al. (2023) reported that perceived usefulness, perceived ease of use, behavioural intention, and positive technological attitudes significantly promoted digital entrepreneurial acceptance among SMEs in Pakistan. Cunningham et al. (2023), Jing et al. (2023), and Nasiri et al. (2023) further demonstrated that technology adoption, entrepreneurial mindset, digital capabilities, collaboration capability, and innovation capability positively influenced value creation, business model innovation, digital transformation, and innovation performance among SMEs operating in Europe, China, and Finland. Comparable findings were reported by Rodrigues et al. (2022), Troise et al. (2022), Ardito et al. (2021), Scuotto et al. (2021), Becker and Schmid (2020), Eller et al. (2020), Ashrafi et al. (2019), Cenamor et al. (2019), Kraus et al. (2019), and Li et al. (2018), all of whom concluded that digitalisation, digital orientation, entrepreneurial capability, business analytics capability, digital platforms, and innovation significantly improved SME growth, competitiveness, organisational agility, and overall business performance.

Notwithstanding these significant contributions, the reviewed studies reveal

important gaps that justify further investigation. Although previous researchers extensively examined digital transformation, digital technologies, innovation capability, entrepreneurial orientation, business model innovation, organisational capability, and digital strategy, little empirical attention has been devoted to the combined influence of the number of digital start-ups, access to venture capital, e-commerce, and fintech loans on the growth of SMEs. These variables represent critical dimensions of entrepreneurship and digital innovation that have become increasingly relevant in today's digital economy but remain largely underexplored within a unified empirical framework. Furthermore, most previous studies concentrated on innovation performance, organisational resilience, digital transformation, competitiveness, and firm performance, with limited emphasis on SME growth driven by entrepreneurial financing and digital entrepreneurial ecosystems. Geographically, the majority of the studies were conducted in China, Finland, Pakistan, Portugal, Austria, Sweden, North America, and several European countries, while the few Nigerian studies focused on SMEs at the national level without paying adequate attention to the peculiar socio-economic and entrepreneurial characteristics of the Niger Delta region.

Methodologically, most of the reviewed studies relied predominantly on cross-sectional survey designs analysed using Structural Equation Modelling (SEM), Partial Least Squares Structural Equation Modelling (PLS-SEM), fuzzy-set Qualitative Comparative Analysis (fsQCA), multiple regression analysis, and systematic literature reviews. While these approaches have generated valuable empirical evidence, they provide limited regional-specific

evidence regarding entrepreneurial financing and digital innovation. Consequently, this study seeks to fill these gaps by investigating how the number of digital start-ups, access to venture capital, e-commerce adoption, and fintech loans drive the growth of Small and Medium Scale Enterprises in the Niger Delta region of Nigeria, thereby contributing fresh empirical evidence to the entrepreneurship and digital innovation literature. If your supervisor prefers, I can also make it sound more like a PhD thesis by using a more analytical and critical writing style rather than a descriptive one.

Methodology

This section discusses the method used in conducting the study and it is organized under the following sub-headings: Area of the study, Research design, population of the study, sample and sampling technique, instrument for data collection, validity of the instrument, reliability of the instrument, method of data collection, and method of data analysis.

Study Area

The study area for this research is the Niger Delta located in the southern part of Nigeria. The region is widely recognized as one of the most resource-rich areas in the country due to its vast reserves of crude oil and natural gas. The Niger Delta covers nine states, namely Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo, and Rivers. These states are officially recognized as part of the Niger Delta by the Niger Delta Development Commission (NDDC) due to their ecological and socio-economic connections to the oil-producing region. Geographically, the Niger Delta is characterized by extensive wetlands, mangrove forests, creeks, and river networks formed by the delta of the Niger River as it

empties into the Atlantic Ocean. The region has a tropical climate with high rainfall, humid conditions, and fertile land that supports agricultural activities such as fishing, farming, and palm produce cultivation. Fishing and small-scale farming traditionally constitute the main livelihood activities for many rural households in the region.

Despite its enormous natural resource endowment, the Niger Delta faces significant developmental challenges. The region has experienced environmental degradation largely associated with oil exploration and production activities carried out by multinational oil companies. Issues such as oil spills, gas flaring, water pollution, and loss of arable land have adversely affected agricultural productivity and the traditional livelihoods of many households. As a result, many communities in the region face persistent poverty, unemployment, and low living standards despite the region's contribution to national revenue. Socio-economically, the Niger Delta is characterized by a high population of rural and vulnerable households whose livelihoods are often unstable due to environmental challenges, inadequate infrastructure, and limited access to social protection programs.

Population/Sampling Techniques

The population of the study is 12,480 SME operators, in the Niger Delta Region. The Niger Delta region is made up of nine states which include Abia, Rivers, Akwa Ibom, Bayelsa, Delta, Cross River, Edo, Imo, and Ondo. These states are officially recognized as part of the Niger Delta due to their geographical location and socio-economic linkages with oil exploration activities in the region.

Sample and Sampling Technique

This study adopted a multi-stage sampling technique to select respondents from the nine states that constitute the Niger Delta region of Nigeria, namely Abia, Akwa Ibom, Bayelsa, Cross River, Delta, Edo, Imo, Ondo, and Rivers States. The multi-stage sampling technique was considered appropriate because of the wide geographical coverage of the study area and the need to ensure adequate representation of respondents across the region. At the first stage, the nine Niger Delta states were purposively selected since they constitute the geographical scope of the study.

At the second stage, one senatorial district was selected from each state using simple random sampling, resulting in a total of nine senatorial districts. At the third stage, two Local Government Areas (LGAs) were randomly selected from each senatorial district, giving a total of eighteen LGAs. At the fourth stage, two communities were selected from each LGA through simple random sampling, resulting in thirty-six communities across the Niger Delta region. At the fifth stage, respondents were selected from the sampled communities using systematic random sampling. A sampling frame comprising eligible respondents in each community was developed, and every k th respondent was selected until the required number of respondents was obtained.

A total sample size of 400 respondents was used for the study. The sample was proportionately allocated among the selected communities based on their population sizes to ensure fair representation. On average, approximately eleven respondents were selected from each of the thirty-six communities, while adjustments were made where necessary to accommodate differences in population

sizes. The adoption of the multi-stage sampling technique enhanced the representativeness of the sample by ensuring that respondents from different states, senatorial districts, local government areas, and communities had an equal opportunity of being selected.

Thereafter, the Taro Yamenes formula was used to determine the sample size of four hundred. The 400 obtained from Taro-Yamane's method is the bench-mark. Therefore, the Sample size of this study is increased to 690 respondent to have a better reflection of the population (Nwankwo, 2016)

This can be illustrated below;

$$\begin{aligned} \text{Where; } n &= \frac{N}{1+N(e)^2} \\ N &= \text{population} = 12480 \\ e &= \text{tolerable error} = 5\% \text{ or } 0.05 \\ n &= ? \\ &= \frac{12480}{1+12480(0.05)^2} \\ n &= \frac{12480}{1+12480(0.0025)} \\ n &= \frac{12480}{1+31.2} \\ n &= \frac{12480}{32.2} \\ n &= 387.55 \text{ or} \\ n &= 388 \end{aligned}$$

Instrument for Data Collection

The primary instrument used for data collection in this study was a structured questionnaire entitled "Entrepreneurship and Digital Innovation Questionnaire (EDIQ)". The questionnaire was considered appropriate because it enabled the collection of standardized information from a large number of respondents within a relatively short period. The questionnaire was divided into two sections. Section A elicited information on the demographic characteristics of the respondents, such as gender, age, educational qualification, marital status, occupation, and state of residence. Section B contained items designed to measure the study variables. The items were structured using a four-point

Likert scale ranging from Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1).

Validity of the Instrument

In order to validate the instrument "Entrepreneurship and Digital Innovation Questionnaire (EDIQ)", the researcher presented it to two lecturers in the Department of Economics, in Isaac Jasper Boro College of Education. The observations and comments made by these experts were imbued in the final draft of this study.

Reliability of the Instrument

To determine the reliability of the study, the instruments were administered to 20 respondents who are not part of the sample to ascertain the internal consistency of the test items. Therefore, the cronbach alpha statistical method was adopted and a coefficient of 0.85 was achieved. The cronbach alpha statistics is suitable for the study because it measures internal consistency between items in sections.

Data Administration and Collection

The formulated research questions were administered directly to the selected respondents in the sampled communities across the nine Niger Delta states. The administration process was carried out with the assistance of trained research assistants who helped explain the purpose of the study and guided respondents where necessary. This approach enhanced the response rate and ensured that the completed questionnaires were properly retrieved for analysis.

Method of Data Analysis

Descriptive statistics such as tables, frequencies, and percentages was used to analyze how entrepreneurship and digital innovation drives growth of small and medium-scale enterprises (SMEs) in the

Niger Delta region of Nigeria. The study adopts multiple regression analysis to analyze the hypothesis with the aid of statistical package for social sciences (SPSS) version 26 at 0.05 level of significance. The multiple regression model is specified below:

Model Specification

$SMEG = f(NDA, AVC, EC, FL)$

$SMEG_{it} = \beta_0 + \beta_1 NDA_{it} + \beta_2 IAVC_{it} + \beta_3 EC_{it} + \beta_4 FL_{it}$

Where;

SMEG = Small and Medium Scale Enterprises

NDA = Number of Digital Start Ups

AVC = Access to Venture Capital

EC = E-commerce

FL = Fintech Loans

Description of Variables in the Model

Small and Medium Scale Enterprises Growth (SMEG): This refers to the expansion and improvement of small and medium-scale enterprises over time, reflected in indicators such as increased sales, profitability, employment, output, market share, assets, and business survival.

Number of Digital Start Ups (NDS): This refers to the number of newly established businesses that primarily use digital technologies, platforms, software, or internet-based solutions to develop and deliver products or services. An increase in the number of digital startups is generally expected to have a positive relationship with small and medium-scale enterprises growth because it promotes innovation, creates new markets, increases competition, and provides digitally driven business opportunities. Thus, more digital startups can contribute to greater small and medium-scale enterprises growth. Hence, $\beta_1 > 0$.

Access to Venture Capital (AVC): This refers to the ability of entrepreneurs and

businesses, particularly high-growth and innovative firms, to obtain investment capital from venture capital investors in exchange for an ownership stake in the business. Access to venture capital is expected to have a positive relationship with small and medium-scale enterprises growth because it provides small and medium-scale enterprises with financial resources needed for business expansion, technology adoption, product development, employment creation, and market penetration. Therefore, increased access to venture capital is expected to increase small and medium-scale enterprises growth. Hence, $\beta_2 > 0$.

E-commerce (EC): This refers to the buying and selling of goods and services, as well as the exchange of payments and business information, through electronic networks, particularly the internet. Increase in e-commerce is expected to have a positive relationship with small and medium-scale enterprises growth because it enables small and medium-scale enterprises to reach wider markets, reduce transaction and marketing costs, operate beyond geographical boundaries, and increase sales. Hence, an increase in e-commerce activities is expected to promote small and medium-scale enterprises growth. Hence, $\beta_3 > 0$.

Fintech Loans (FL): This refers to loans provided to individuals or businesses through financial technology platforms, usually using digital applications, online platforms, mobile technology, and alternative methods of credit assessment rather than conventional bank lending processes. Increase in Fintech loans are expected to have a positive relationship with small and medium-scale enterprises growth because they can improve small and medium-scale enterprises growth access to finance, particularly for businesses that may face difficulties obtaining conventional bank

loans. Increased availability of fintech loans can therefore support investment, working capital, business expansion, and ultimately small and medium-scale enterprises growth. Hence, $\beta_4 > 0$.

Empirical Results and Analysis

This section presents the analysis and interpretation of data collected for the study on the role of entrepreneurship and digital innovation in driving the growth of small and medium-scale enterprises (SMEs) in the Niger Delta region of Nigeria. The analysis is structured in line with the specific objectives, research questions and hypotheses of the study. The chapter presents the response rate, demographic characteristics of respondents, descriptive analysis of the study variables, and multiple regression analysis. The hypotheses were tested at a 5% level of significance. The regression analysis examines the role of entrepreneurship and digital innovation in driving the growth of small and medium-

scale enterprises (SMEs) in the Niger Delta region of Nigeria.

Questionnaire Response Rate

A total of four hundred (388) copies of the questionnaire were administered to respondents across the selected states in the Niger Delta Region. Out of this number, three hundred and seventy-six (376) questionnaires were successfully retrieved, while twelve (12) were not returned. Consequently, the three hundred and seventy-six (376) representing 97% of the administered questionnaires were validly completed and used for the analysis.

Answer to Research Questions: The research questions were answered using mean and standard deviation at 2.5 mean benchmark.

Research Question One: How has number of start-ups enhanced small and medium scale enterprises in Niger delta region?

Table 1: Mean scores and standard deviation of respondents on the extent number of start-ups enhanced small and medium scale enterprises in Niger delta region? (N=376)

S/N	How has number of start-ups enhanced small and medium scale enterprises in Niger delta region?	Mean	St.d	Remark
1	The increasing number of digital start-ups has created new business opportunities for SMEs in the Niger Delta Region	2.80	0.62	Agreed
2	Digital start-ups have encouraged SMEs to adopt innovative business practices.	2.78	0.62	Agreed
3	The growth of digital start-ups has improved the competitiveness of SMEs in the Niger Delta Region.	2.81	0.69	Agreed
4	Digital start-ups have provided SMEs with access to new markets and customers.	2.77	0.65	Agreed
5	The increasing number of digital start-ups has contributed to the overall growth and expansion of SMEs in the Niger Delta Region.	2.77	0.63	Agreed
Aggregate mean scores & St.d		2.8	0.6	Agreed

Criterion Mean: ≥ 2.5

Source: Authors Computation, 2026

Table 1 indicates that respondents agreed that the increasing number of digital start-ups has created new business opportunities for SMEs, with a mean score of 2.80 and standard deviation of 0.62. This implies that digital start-ups are creating entrepreneurial opportunities and stimulating business expansion among SMEs. Similarly, the adoption of innovative business practices recorded a mean of 2.78 (SD = 0.62), indicating that digital start-ups encourage technological and operational innovation among SMEs. The improvement in SME competitiveness recorded the highest mean of 2.81 (SD = 0.69), suggesting that digital start-ups enhance firms' competitive efficiency. Access to new markets and customers recorded a mean of

2.77 (SD = 0.65), while their contribution to overall SME growth and expansion also recorded 2.77 (SD = 0.63), indicating that digital start-ups facilitate market penetration and enterprise expansion. The aggregate mean of 2.80, which exceeds the criterion mean of 2.50, indicates overall agreement that the increasing number of digital start-ups enhances SME growth in the Niger Delta Region. The aggregate standard deviation of 0.60 indicates relatively low dispersion and reasonable consistency in respondents' opinions.

Research Question Two: To what extent has access to venture capital improved small and medium scale enterprises in Niger delta region?

Table 2: Mean scores and standard deviation of respondents on the extent access to venture capital improved small and medium scale enterprises in Niger delta region? (N=376)

S/N	To what extent has access to venture capital improved small and medium scale enterprises in Niger delta region?	Mean	St.d	Remark
6	Access to venture capital provides SMEs with adequate funds for business expansion.	2.80	0.62	Agreed
7	Venture capital enables SMEs to invest in new technologies and innovative business activities.	2.82	0.65	Agreed
8	Access to venture capital improves the capacity of SMEs to introduce new products and services.	2.76	0.59	Agreed
9	Venture capital financing enhances the competitiveness of SMEs in the Niger Delta Region.	2.84	0.62	Agreed
10	Access to venture capital contributes significantly to the growth and sustainability of SMEs.	2.81	0.59	Agreed
Aggregate mean scores & St.d		2.8	0.6	Agreed

Criterion Mean: ≥ 2.5

Source: Authors Computation, 2026

The results in Table 2 demonstrate access to venture capital provides SMEs with funds for business expansion, recording a mean of 2.80 and standard deviation of 0.62. This implies that venture capital helps to relax SMEs' financing constraints and increases their capacity for investment and

expansion. Investment in new technologies and innovative activities recorded a mean of 2.82 (SD = 0.65), suggesting that venture capital promotes technological upgrading and innovation. The ability to introduce new products and services recorded a mean of 2.76 (SD = 0.59), indicating that venture

financing supports product diversification and innovation. Venture capital's contribution to SME competitiveness recorded the highest mean of 2.84 (SD = 0.62), suggesting that improved access to investment capital strengthens firms' competitive position. Its contribution to SME growth and sustainability recorded a mean of 2.81 (SD = 0.59), further indicating its importance for enterprise development. The aggregate mean of 2.80, above the

criterion mean of 2.50, indicates that respondents generally agreed that access to venture capital improves SME growth in the Niger Delta Region. The aggregate standard deviation of 0.60 indicates relatively consistent responses.

Research Question Three: How has e-commerce influenced small and medium scale enterprises in Niger delta region?

Table 3: Mean scores and standard deviation of respondents on the extent e-commerce influenced small and medium scale enterprises in Niger delta region? (N=376)

S/N	How has e-commerce influenced small and medium scale enterprises in Niger delta region?	Mean	St.d	Remark
11	E-commerce has enabled SMEs to reach customers beyond their immediate geographical locations.	2.82	0.60	Agreed
12	The use of e-commerce platforms has increased sales opportunities for SMEs.	2.76	0.59	Agreed
13	E-commerce has reduced some of the operating and marketing costs of SMEs.	2.78	0.62	Agreed
14	E-commerce has improved the competitiveness of SMEs in the Niger Delta Region.	2.82	0.60	Agreed
15	Increased adoption of e-commerce has contributed to the growth and expansion of SMEs.	2.81	0.64	Agreed
Aggregate mean scores & St.d		2.8	0.6	Agreed

Criterion Mean: ≥ 2.5

Source: Authors Computation, 2026

Table 3 reveals that e-commerce enables SMEs to reach customers beyond their immediate geographical locations, with a mean of 2.82 and standard deviation of 0.60. This implies that e-commerce expands SMEs' market reach and reduces geographical barriers to trade. Increased sales opportunities recorded a mean of 2.76 (SD = 0.59), indicating that digital platforms provide additional channels for revenue generation. The reduction in operating and marketing costs recorded a mean of 2.78 (SD = 0.62), suggesting that e-commerce contributes to transaction-cost efficiency. Improved SME competitiveness recorded a

mean of 2.82 (SD = 0.60), indicating that digital market participation strengthens competitive capacity. Finally, the contribution of e-commerce to SME growth and expansion recorded a mean of 2.81 (SD = 0.64), demonstrating its perceived contribution to enterprise development. The aggregate mean of 2.80, which is higher than the criterion mean of 2.50, indicates that respondents agreed that e-commerce positively influences SME growth in the Niger Delta Region. The aggregate standard deviation of 0.60 shows that the responses were relatively consistent.

Research Question Four: To what extent has fintech loan improved small and medium scale enterprises in Niger delta region?

Table 4: Mean scores and standard deviation of respondents on the extent fintech loan improve small and medium scale enterprises in Niger delta region? (N=376)

S/N	To what extent has fintech loan improves small and medium scale enterprises in Niger delta region?	Mean	St.d	Remark
16	Fintech loans have made it easier for SMEs to access business financing.	2.80	0.60	Agreed
17	Fintech lending platforms provide SMEs with faster access to credit than traditional lending institutions.	2.81	0.62	Agreed
18	Access to fintech loans enables SMEs to expand their business operations.	2.82	0.63	Agreed
19	Fintech loans provide SMEs with funds for investment in digital and productive activities.	2.85	0.60	Agreed
20	Increased access to fintech loans has contributed to the growth and sustainability of SMEs in the Niger Delta Region..	2.84	0.60	Agreed
Aggregate mean scores & St.d		2.8	0.6	Agreed

Criterion Mean: ≥ 2.5

Source: Authors Computation, 2026

Results from table 4 indicate that fintech loans make it easier for SMEs to access business financing, with a mean score of 2.80 and standard deviation of 0.60. This implies that fintech lending reduces credit-access constraints and improves SMEs' financial inclusion. Faster access to credit compared with traditional lending institutions recorded a mean of 2.81 (SD = 0.62), suggesting that fintech platforms reduce credit-processing time and improve financial accessibility. Access to fintech loans for business expansion recorded a mean of 2.82 (SD = 0.63), indicating that digital credit supports increased productive capacity. Financing for digital and productive activities recorded the highest

mean of 2.85 (SD = 0.60), suggesting that fintech credit can facilitate investment in productive assets and digital technologies. Similarly, the contribution of fintech loans to SME growth and sustainability recorded a mean of 2.84 (SD = 0.60), indicating a perceived positive contribution to enterprise development. The aggregate mean of 2.80, exceeding the criterion mean of 2.50, indicates that respondents agreed that fintech loans improve SME growth in the Niger Delta Region. The aggregate standard deviation of 0.60 indicates relatively low variation in respondents' opinions and therefore reasonable consistency in the responses.

Hypotheses Testing Multiple Regression

Table 5: Multiple Regression on Entrepreneurship and Digital Innovation: Driving Small and Medium Scale Enterprises Growth

Model	Coefficient		Unstandardized Coefficient Beta	T	Sig
	Standardized Coefficient B	Std. Error			
(Constant)	3.830	.858		4.466	.000
NDS	.126	.045	.136	2.807	.005
AVC	.300	.050	.300	6.044	.000
EC	.227	.049	.226	4.640	.000
FL	.072	.050	.072	1.438	.151
R ² = 0.288, Adj R ² =0.281, F-Stat = (0.000) Dependent Variable (SMEG: SME Growth)					

Significance @ 5% significant Level

Source: Field Survey, 2026

The multiple result in table 5 revealed that the coefficient of Number of Digital Startups is 0.126 and statistically significant ($p = 0.005$). This implies that a one-unit increase in the number of digital startups, increases Small and Medium Scale Enterprises growth by 0.12%. Thus, digital entrepreneurship generates positive externalities for Small and Medium Scale Enterprises expansion. Accordingly access to Venture Capital has a coefficient of 0.300 and is statistically significant ($p < 0.001$). Hence, a one-unit increase in access to venture capital increases Small and Medium Scale Enterprises growth by 0.300 units, holding other factors constant. This suggests that improved access to investment finance enhances capital accumulation and enterprise expansion. Access to Venture Capital also has the largest standardized coefficient ($\beta = 0.300$), making it the strongest predictor in the model.

Furthermore, the coefficient of E-commerce: of 0.227 is positive and statistically significant ($p < 0.001$). Therefore, a one-unit increase in e-commerce activity increases Small and Medium Scale Enterprises growth by 0.23%.

This indicates that digital market access and reduced transaction costs contribute significantly to Small and Medium Scale Enterprises expansion. Finally, the coefficient Fintech Loans is 0.072, indicating a positive relationship with Small and Medium Scale Enterprises growth, but it is statistically insignificant ($p = 0.151$). Thus, although increased fintech lending is associated with a 0.072-unit increase in Small and Medium Scale Enterprises growth, the effect is not sufficiently strong statistically to establish a significant economic relationship in the sample.

Discussion of Findings

Number of Digital Startups and Small and Medium Scale Enterprises Growth

Inference drawn from the multiple regression indicates that the number of digital startups has a positive and statistically significant effect on Small and Medium Scale Enterprises growth ($\beta = 0.126$; $p = 0.005$). This implies that an increase in digital startups contributes to Small and Medium Scale Enterprises growth expansion by stimulating innovation, creating new market opportunities,

improving business processes and increasing competitive efficiency. The result suggests that the emergence of more digitally oriented enterprises strengthens the entrepreneurial ecosystem and generates positive spillover effects for Small and Medium Scale Enterprises growth development. This finding is consistent with Kraus et al. (2019), who established that digital technologies create new entrepreneurial opportunities and improve operational efficiency, thereby enhancing small and Medium Scale Enterprises growth and business performance. Thus, the significant positive coefficient obtained in the present study reinforces the argument that digital entrepreneurship constitutes an important driver of SME expansion.

Access to Venture Capital and Small and Medium Scale Enterprises Growth

Submission drawn from the multiple regression revealed that access to venture capital has a positive and statistically significant effect on Small and Medium Scale Enterprises growth ($\beta = 0.300$; $p < 0.001$). This indicates that improved access to venture capital enhances the capacity of Small and Medium Scale Enterprises growth to mobilise investment resources, expand productive capacity, adopt new technologies and exploit emerging market opportunities. Economically, venture capital alleviates financing constraints and facilitates capital accumulation, which can translate into higher enterprise growth. Earlier study by Verhoef et al. (2021), established that organisational resources significantly strengthen firms' ability to exploit digital technologies and improve business performance.

E-commerce and Small and Medium Scale Enterprises Growth

Suggestion drawn from the multiple regression results establishes that e-commerce has a positive and statistically

significant effect on Small and Medium Scale Enterprises growth ($\beta = 0.227$; $p < 0.001$). This means that increased e-commerce activity contributes to enterprise expansion by widening market access, improving customer reach, reducing transaction costs and enabling small and Medium Scale Enterprises to operate beyond traditional geographical boundaries. The finding is consistent with Cenamor et al. (2019), who found that digital platform capability had a positive and significant effect on Small and Medium Scale Enterprises growth and that network capabilities enhanced small and Medium Scale Enterprises performance. The implication is that greater utilisation of digital platforms, including e-commerce platforms, can improve Small and Medium Scale Enterprises market penetration and competitive position, thereby stimulating growth.

Fintech Loans and Small and Medium Scale Enterprises Growth

Insinuation drawn from the multiple regression for fintech loans is positive but statistically insignificant ($\beta = 0.072$; $p = 0.151$). This indicates that although greater access to fintech-based credit is associated with an increase in Small and Medium Scale Enterprises growth, the effect is not sufficiently strong to establish a statistically reliable relationship within the study period or sample. Economically, this may imply that access to digital credit alone does not automatically translate into productive investment or enterprise expansion. Factors such as the size and cost of loans, repayment obligations, financial literacy and the productive utilisation of borrowed funds may determine whether fintech credit generates growth. The result is consistent with Ilyas et al. (2023), who found that digital entrepreneurial acceptance is significantly influenced by perceived

usefulness and ease of use. This suggests that the availability of digital financial solutions may not be sufficient by itself; their perceived usefulness, accessibility and effective utilisation are also important for generating meaningful entrepreneurial outcomes.

Conclusion

This paper investigated the role of entrepreneurship and digital innovation in driving the growth of small and medium-scale enterprises (SMEs) in the Niger Delta region of Nigeria. The findings suggest that number of digital startups, access to venture capital and e-commerce had a positive and statistical significant relationship with small and medium scale enterprises growth. However, fintech loans had a positive but insignificant relationship with small and medium scale enterprises growth. Hence, it was concluded that entrepreneurship and digital innovation is a key driver of the growth of small and medium-scale enterprises (SMEs) in the Niger Delta region of Nigeria.

Recommendation

- i. The Niger Delta Development Commission (NDDC), in collaboration with state governments across the Niger Delta, institutionalize structured startup promotion programmes. This should include the establishment of innovation hubs, enterprise incubation centres, and technology parks within the region.
- ii. The Bank of Industry (BOI) should expand its venture financing schemes within the Niger Delta through blended finance models and risk-sharing partnerships with private investors.
- iii. Furthermore, the National Information Technology Development Agency (NITDA), in collaboration with state Ministries of Commerce and Industry in the Niger Delta, should intensify digital

transformation initiatives. These should include broadband expansion projects, digital skills training for SME operators, cybersecurity awareness campaigns, and incentives for integrating digital payment systems.

- iv. Finally, the Central Bank of Nigeria (CBN), through its regional development finance offices, strengthen regulatory oversight and develop guidelines that ensure fintech credit is channeled toward productive investments.

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