Impact of Innovation and Technology Adoption, And Business Model on Sustainability of SMES in South-South Nigeria

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Abstract
The study investigated the impact of innovation and technology adoption and business model on sustainability of SMEs In South-South Nigeria. The researcher adopted primary source to collect data from the respondents. In this study, a mixed research design- survey and correlational- was adopted. The total population was seven hundred and sixty-three (763) SMEs proprietors/managers. The sample size of the study was 262 derived statistically from Taro Yamane formula. The researcher adopted simple random sampling technique. Regression model and Pearson correlation coefficient were used to test the relationships between dependent and independent variables of the study. Two hundred and sixty-two (262) copies of questionnaire were distributed to selected SMEs in South-South, Nigeria. Eight (8) copies of questionnaire where wrongly filled and discarded with 3.1%. However, two hundred and fifty-four (254) copies of questionnaire were properly completed and returned, constituting 96.9% response rate. The findings of the study revealed that there was a significant difference between innovation and technology adoption on the sustainability of SMEs. There was a significant difference between business models and sustainability of SMEs. The study concludes that entrepreneurship development, through innovation, strategic business models, plays a critical and integrated role in driving the sustainability of SMEs in South-South Nigeria. The study recommended that SME owners and managers should increase investment in modern technologies such as digital platforms, cloud computing, automation tools, and business management software to improve operational efficiency, productivity, and long-term sustainability.

Keywords: *Innovation and Technology, Business Model, Sustainability and SMEs*

Introduction

Innovation has become a critical driver of organizational performance and sustainability. It involves the introduction of new products, processes, services, or ideas that improve efficiency and create value. According to Joseph Schumpeter, innovation is the engine of economic development, enabling firms to achieve competitive advantage through "creative destruction." For SMEs, innovation is particularly important because it allows them to compete with larger firms despite their limited resources. Innovative SMEs are more likely to respond effectively to market changes, customer demands, and competitive pressures, thereby enhancing their survival and growth prospects. Closely related to innovation is technology adoption, which refers to the acceptance and utilization of new technologies to improve business operations. The increasing

digitization of business activities, driven by advancements in information and communication technologies (ICT), has transformed how firms operate, communicate, and deliver value. The Technology Acceptance Model provides a useful framework for understanding how perceived usefulness and ease of use influence the adoption of technology within organizations. For SMEs, adopting technologies such as digital payment systems, e-commerce platforms, cloud computing, and data analytics can significantly enhance operational efficiency, market reach, and customer engagement. However, the rate of technology adoption among SMEs in developing economies remains relatively low due to factors such as high costs, lack of technical expertise, and resistance to change (Nnadi, 2014). In addition to innovation and technology adoption, business model design plays a crucial role in the sustainability of SMEs. A business model describes how a firm creates, delivers, and captures value. Traditional business models are increasingly being challenged by dynamic market conditions, globalization, and digital disruption. As a result, SMEs must rethink and adapt their business models to remain viable. The concept of business model innovation emphasizes the need for firms to continuously redesign their value propositions, revenue streams, and operational processes to align with changing market demands. For instance, the shift from physical retail to online platforms has compelled many SMEs to adopt hybrid or fully digital business models. Sustainability, in the context of SMEs, extends beyond financial performance to include environmental and social dimensions. Sustainable SMEs are those that can maintain consistent performance over time while minimizing negative environmental impacts and contributing positively to society. The integration of innovation, technology adoption, and effective business models is essential for achieving sustainability. Innovation enables SMEs to develop eco-friendly products and processes, technology adoption improves resource efficiency and reduces operational costs, while adaptive business models ensure long-term value creation and resilience (Agboli, & Ukaegbu, 2016). According to Adebayo, (2019), in Nigerian SMEs face unique challenges that hinder their sustainability, including inconsistent government policies, inadequate infrastructure, and limited access to modern technologies. Despite various initiatives by institutions such as the Small and Medium Enterprises Development Agency of Nigeria, many SMEs still struggle to integrate innovation and technology into their operations. This situation underscores the need for empirical studies to examine how innovation, technology adoption, and business model design influence the sustainability of SMEs. Furthermore, the global business environment is becoming increasingly competitive and technology-driven, making it imperative for SMEs to adapt or risk extinction. The emergence of digital economies, artificial intelligence, and automation has redefined traditional business practices, requiring SMEs to be more agile and forward-thinking. Those that fail to innovate or adopt relevant technologies are likely to experience declining performance and eventual exit from the market. Therefore, this paper seeks to explore the interplay between innovation, technology adoption, and business models on the sustainability of SMEs in South-South Nigeria.

Objectives of The Study

The general objective of this study was to examine impact of innovation and technology adoption, and business model on sustainability of SMEs in South-South Nigeria. The specific objectives were to:

i. evaluate the impact of innovation and technology adoption on the sustainability of SMEs in South- South Nigeria;
ii. assess the impact of business models on sustainability of SMEs in South South Nigeria;

RESEARCH QUESTIONS

The following research questions were answered.

i. What is the impact of innovation and technology adoption on the sustainability of SMEs in South South Nigeria?
ii. What is the impact of business models on sustainability of SMEs in South South Nigeria?

Research Hypotheses

In order to achieve precision in the analysis, the hypotheses were formulated. Drawing from the specific objectives, the research was guided by the following null hypotheses at .05 level of significance:

Ho1: There is no significant difference between innovation and technology adoption on the sustainability of SMEs in South South Nigeria.

Ho2: There is no significant difference between business models and sustainability of SMEs in South South Nigeria.

Literature Review

Conceptual Review

Innovation and Technology Adoption as Entrepreneurship Development Strategy

Innovation and technology adoption as development strategy focuses on how the introduction, acceptance, and utilization of new ideas and technological systems influence an organization's ability to achieve long-term economic, environmental, and social goals. Innovation is the process of developing and implementing new or improved products, services, processes, or business models that create value. Technology adoption refers to the degree to which organizations accept and integrate modern technologies such as information systems, automation, artificial intelligence, and digital platforms into their operations. Sustainability, in this context, is understood through the triple bottom line approach, which emphasizes economic viability, environmental protection, and social responsibility (Babu, Krishna, & Swathi, 2013).

Conceptually, innovation and technology adoption act as key driver of sustainability by enabling organizations to improve efficiency, optimize resource utilization, and reduce environmental impact. Through process innovation and technological advancement, firms can minimize waste, lower energy consumption, and adopt cleaner production methods, thereby enhancing environmental sustainability. For example, the use of energy-efficient machinery and renewable energy technologies helps organizations reduce carbon emissions and ecological degradation. From an economic perspective, innovation and technology adoption improve productivity, operational efficiency, and competitiveness. Technologies such as automation and data analytics streamline business processes, reduce costs, and support informed decision-making. This strengthens the financial performance of organizations and ensures their long-term survival, which is central to economic sustainability (Pearce & Robison, 2013).

In terms of social sustainability, technological innovation enhances the quality of life for employees and society. It improves workplace safety, facilitates better communication, and increases access to essential services such as education, healthcare, and financial systems. Additionally, innovation can foster inclusive growth by creating new employment opportunities and improving service delivery. The concept can therefore be viewed as a relationship in which innovation and technology adoption (independent variables) influence sustainability outcomes (dependent variable). This relationship may also be moderated or mediated by factors such as

organizational culture, leadership style, regulatory frameworks, and human capital development. However, the impact of innovation and technology adoption on sustainability is not without challenges. High implementation costs, resistance to change, lack of technical expertise, and cybersecurity concerns can hinder effective adoption. Therefore, organizations must strategically manage these challenges to fully realize the sustainability benefits.

To increase creativity and innovation in organizations is a reasonable strategy based on innovation (diversification) to adopt. Strategy is based on innovation, creativity and individual initiative. This kind of strategy to Creating and market a unique product offering, through product diversification efforts, and usually features the organization's strategy into a product and relies an innovative the uniqueness of the significant domain Advertise (Arabi, 2021). Implementing strategies to increase creativity and Innovation in competitive strategies can be summarized as follows:

1- The first and most important step is needed in the organizations today understand the importance of creativity and innovation.

2- Apply In the differences between employee compensation and benefits, organizational, material and spiritual thought and creative work, with those in the conventional way of doing things in the fall.

3- Workshops in creativity and techniques applied in the organization and to clear activities of these courses for the staff.

4- Other bands set to perform applied research in the field of Innovation in process improvement;

5- Identify new and creative needs of the business;

6- Awareness of creativity, strengthen and make use of it;

7- Increasing scientific daring spirit, criticism, and criticism (Allen & Helms, 2021).

Innovation and technology are a management system that focuses on the organization's mission, seeking exceptional opportunities and determines whether the proper strategic direction of the organization or not, will determine the success criteria and seek new opportunities. Drucker believes that successful innovation requires hard work has focused and targeted. Innovation is a key factor in creating competitive globally, leading to organizational growth and include future success and as the global economy efficiency engine that allows companies are continuing. Innovation and technology companies should be able to create a stream of new products and processes, and technologies to further exploit and yet, in order to sustain life and put a step forward. Drucker stated with emphasis that every organization needs a basic abilities and skills and innovation. Innovation is a multidimensional affair (Arabi & Mousavi, 2018).

Business Model as Entrepreneurship Development Strategy

Business models as a development strategy examines how organizations create, deliver, and capture value, influences their ability to achieve long-term economic, environmental, and social objectives. A business model defines the structure through which a firm operates, including its value proposition, revenue streams, cost structure, customer relationships, and key resources. Sustainability, in this context, refers to the ability of organizations to maintain performance while balancing economic viability, environmental protection, and social responsibility. Conceptually, business models are central to sustainability because they determine how resources are utilized, how value is distributed, and how organizational activities affect society and the environment. Traditional business models often focus primarily on profit maximization, sometimes at the expense of environmental and social considerations. In contrast, sustainable business models

integrate sustainability principles into their core operations, aligning profitability with environmental stewardship and social value creation.

From an economic perspective, business models influence sustainability by shaping how firms generate revenue and control costs. Innovative models—such as subscription-based services, platform models, and sharing economy systems—can enhance efficiency, reduce operational costs, and ensure long-term financial stability. These models often promote resource optimization and continuous value creation, thereby supporting economic sustainability (Gatto, 2020). Environmentally, business models play a critical role in determining the level of resource consumption and waste generation. Sustainable business models, such as circular economy models, emphasize reuse, recycling, and waste reduction. For example, product-as-a-service models reduce the need for ownership and encourage efficient use of resources, thereby minimizing environmental impact. Socially, business models affect stakeholders, including employees, customers, and communities. Inclusive business models promote fair labor practices, equitable access to products and services, and community development. They also foster transparency, ethical practices, and stakeholder engagement, which are essential components of social sustainability. Entrepreneurship development has become a central focus for economic growth, job creation, and innovation, particularly in developing economies such as Nigeria. One of the most critical tools for achieving successful entrepreneurship development is the business model. A business model serves as a strategic framework that defines how a business creates, delivers, and captures value. For entrepreneurs, especially those operating Small and Medium Scale Enterprises (SMEs), an effective business model is not just a plan but a dynamic strategy that determines sustainability, competitiveness, and growth. At its core, a business model outlines key components such as value proposition, customer segments, revenue streams, cost structure, distribution channels, and key partnerships. The concept gained prominence through scholars like Alexander Osterwalder, who introduced the Business Model Canvas as a practical tool for designing and analyzing business models. This framework enables entrepreneurs to systematically map out how their ideas can be transformed into viable and profitable ventures (Bougeoise, 2012). Furthermore, a well-structured business model enhances resource efficiency, which is particularly important for startups and SMEs with limited resources. By clearly identifying revenue streams and cost drivers, entrepreneurs can allocate resources more effectively, minimize waste, and maximize profitability. This strategic clarity reduces business risks and increases the likelihood of long-term success. Business models also play a crucial role in attracting investment and funding. Investors and financial institutions are more likely to support ventures with clear, scalable, and sustainable business models. A strong business model demonstrates the feasibility of the business idea and provides confidence in its potential for growth and returns (Box, 2019).

In the context of entrepreneurship development, business models facilitate innovation by encouraging entrepreneurs to think creatively about how they can differentiate their offerings. This includes exploring new markets, developing unique value propositions, and adopting unconventional revenue models such as subscription services, freemium models, and platform-based approaches. Moreover, business models contribute to sustainability by integrating economic, social, and environmental considerations into business operations. Entrepreneurs are increasingly adopting sustainable business models that not only generate profit but also address societal challenges such as unemployment, environmental degradation, and social inequality. This aligns with global trends toward responsible and inclusive entrepreneurship (Edralin et al, 2019).

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Small and Medium Scale Enterprises

Small and Medium Scale Enterprises (SMEs) play a pivotal role in the economic development of many nations, particularly in developing countries such as Nigeria. SMEs are widely regarded as engines of growth due to their contributions to employment generation, income distribution, poverty alleviation, and industrial development. In Nigeria, SMEs constitute a significant proportion of businesses and are central to the country's efforts toward economic diversification, especially in reducing overdependence on the oil sector. The concept of SMEs varies across countries and institutions, often defined based on criteria such as number of employees, asset base, and turnover. In Nigeria, the Small and Medium Enterprises Development Agency of Nigeria defines SMEs as enterprises with assets (excluding land and buildings) ranging from ₦5 million to ₦500 million and employing between 10 and 199 workers. This classification distinguishes SMEs from micro enterprises and large corporations, emphasizing their intermediate role in the business ecosystem (Beck, & Demirguc-Kunt, 2016).

Historically, the development of SMEs in Nigeria can be traced back to the post-independence era when the government began to recognize the importance of indigenous enterprises in fostering economic growth. Over the years, various policies and programs have been introduced to support SME development, including financial assistance schemes, entrepreneurship training, and infrastructural development initiatives. Institutions such as the Central Bank of Nigeria and SMEDAN have played key roles in promoting SME growth through funding programs, policy formulation, and capacity-building initiatives. Despite their importance, SMEs in Nigeria face numerous challenges that hinder their growth and sustainability. One of the most significant challenges is limited access to finance. Many SMEs struggle to obtain loans from formal financial institutions due to high interest rates, stringent collateral requirements, and perceived risk by lenders. This financial constraint limits their ability to expand operations, invest in technology, and improve productivity (Eni, 2015).

Mandam, (2012), posited another major challenge is inadequate infrastructure. Issues such as unreliable power supply, poor transportation networks, and limited access to modern communication technologies significantly increase the cost of doing business in Nigeria. SMEs often rely on alternative sources of energy, such as generators, which further strain their limited financial resources and reduce profitability. In addition, managerial and technical capacity constraints pose serious challenges to SME development. Many SME owners lack formal business training, which affects their ability to make strategic decisions, manage resources effectively, and

adapt to changing market conditions. This often results in poor business planning, weak financial management, and low levels of innovation. Regulatory and policy inconsistencies also affect SME operations in Nigeria. Frequent changes in government policies, multiple taxation, and bureaucratic bottlenecks create an uncertain business environment that discourages investment and growth. Although efforts have been made to improve the ease of doing business, many SMEs still face difficulties in complying with regulatory requirements.

Furthermore, globalization and technological advancement have introduced new competitive pressures for SMEs. The rise of digital technologies and e-commerce has transformed the business landscape, requiring SMEs to adopt innovative practices and modern technologies to remain competitive. However, many Nigerian SMEs are slow in adopting these technologies due to lack of awareness, inadequate skills, and financial constraints. Despite these challenges, SMEs in Nigeria have demonstrated resilience and adaptability. They continue to provide employment opportunities for a large segment of the population, particularly in the informal sector, and contribute significantly to the country's Gross Domestic Product (GDP). SMEs are also instrumental in fostering entrepreneurship and innovation, serving as a breeding ground for new ideas and business ventures. Recognizing the importance of SMEs, the Nigerian government and various stakeholders have intensified efforts to support their development. Initiatives such as access to microfinance, entrepreneurship development programs, and digital transformation strategies are aimed at enhancing the capacity and competitiveness of SMEs. Additionally, there is increasing emphasis on promoting innovation, technology adoption, and sustainable business practices among SMEs to ensure their long-term survival (Ebiringa, 2012).

Theoretical Framework

Systematic Theory of Innovation.

Systematic innovation theory was propounded by Peter Druckard in 1959 consists of the purposeful and organized search for changes, and in the systematic analysis of the opportunities such changes might offer for economic or social innovation. Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service. Entrepreneurs, shift resources from areas of low productivity and yield to areas of higher productivity. "Innovation," is an economic or social rather than a technical term. It can be defined the way J. B. Say defined entrepreneurship, as changing the yield of resources. Or, as a modern economist would tend to do, it can be defined in demand terms rather than in supply terms, that is, as changing the value and satisfaction obtained from resources by the consumer. Entrepreneurship is "risky" mainly because so few of the so-called entrepreneurs know what they are doing. The unexpected failure demands that you go out, look around, and listen. Failure should always be considered a symptom of an innovative opportunity, and taken seriously as such. Managements must look at every unexpected success with the questions: (1) What would it mean to us if we exploited it? (2) Where could it lead us? (3) What would we have to do to convert it into an opportunity? And (4) How do we go about it? This means, first, that managements need to set aside specific time in which to discuss unexpected successes; and second, that someone should always be designated to analyze an unexpected success and to think through how it could be exploited. Entrepreneurship, then, is behavior rather than personality trait. And its foundation lies in concept and theory rather than in intuition.

Innovation Theory (IT) by Joseph A. Schumpeter

The Innovation Theory was proposed by Joseph Schumpeter in 1934, who believed that an entrepreneur could earn economic profits by introducing successful innovations. In other words, innovation theory of profit postulates that the primary function of an entrepreneur is to introduce innovations while the profit in the form of reward is given for his performance. Schumpeter, innovation refers to any new policy that an entrepreneur undertakes to reduce the overall cost of production or increase the demand for his products.

Thus, all activities that lead to a reduction in the overall cost of production such as the introduction of a new method or technique of production, the introduction of new machinery, innovative methods of organising the industry among others can be regarded as an innovation. Also, there are other activities which increase the demand for a product. For example, the introduction of a new commodity or new quality goods, the emergence or opening of a new market, finding new sources of raw materials, a new variety or a design of the product among others. In short, the innovation theory of profit posits that the entrepreneur gains profit if his innovation is successful either in reducing the overall cost of production or increasing the demand for his product. Often, the profits earned are for a shorter duration as the competitors imitate the innovation, thereby ceasing the innovation to be new or novice. Earlier, the entrepreneur was enjoying a monopoly position in the market as innovation was confined to himself and was earning more substantial profits. However, after some time, without the introduction of innovation, the profits started disappearing. Thus, the extent at which individual entrepreneur could introduce innovation into their business depends on their skills acquisition, the more an entrepreneur gained skills, the more the innovation available for them to use for their business the more their competitiveness and overall customers performance among others.

Empirical Studies

Adeyeyetolulope, (2024) researched on impact of technological innovation on organizational performance. This study investigated the impact of technological innovation on organizational performance. The objectives of the study were to determine relationship between strategic planning and marketing planning capabilities on organizational performance in the manufacturing industry. The study employed survey research. Primary data was used with questionnaire as research instrument. The subjects were 137 employees of Nestle Foods Nigeria Plc. The four hypotheses formulated for this study were tested using correlation, regression analysis, Pearson's Correlation and Analysis of Variance (ANOVA), with the aid of Statistical Package for Social Sciences (SPSS). The findings from the study revealed that strategic planning and marketing capability independently and jointly influence organizational performance. Also, there is positive interaction between performance variables (i.e resources availability, staff quality, productivity, sales revenue, financial strength, public image and good will). Based on the finding, it was recommended that there is the need for organisations to be innovative technologically to be competitive in the market. And companies should train their employee for better efficiency and effectiveness. Similarly, the study of Adeyeyetolulope (2024) revealed tha corporate entrepreneurship (innovativeness, proactiveness, risk-taking) positively enhance organizational performance**.** **T**his aligns strongly with entrepreneurship development, as innovation is a core determinant of entrepreneurial success.

Diana, Li, and Paul, (2021) studied the effects of business model on start-up speed and outcomes. This study examines start-up speed, or the time between when a nascent entrepreneur enters the

venturing process and exits by creating a new firm or quitting. Time is an important feature of the entrepreneurship processes because it is linked to the reduction of societal costs associated with start-up efforts that remain in hopeless "pending" states. Using event history analysis, we model the competing risks of becoming a new firm or quitting on representative samples of United States, Australian, Chinese, and Swedish nascent entrepreneurs. We examine the effects of business planning and the initial timing of planning on the time it takes entrepreneurs to create either a new firm birth or quit the start-up process. Results indicate that formal planning close to the initial entry point of the start-up process significantly reduces the time required to achieve profitability and increases the likelihood of achieving profitability. Conversely, unwritten planning later in the startup processes reduces the time required to achieve profitability, and increases the likelihood of achieving profitability. corporate entrepreneurial orientation. Diana, Li, and Paul, (2021) study similarly revealed that organizational support enhances creativity. These factors help foster a vibrant entrepreneurial culture.

Methodology

This study adopted a mixed research design- survey and correlational, specifically combining the survey research design and correlational research design. The survey research design provided the framework for gathering data from the respondents, while the correlational research design enabled the researcher to examine the statistical relationships between the independent and dependent variables. This study was carried out in South South, Nigeria. The total population was seven hundred and sixty-three (763) proprietors/managers. The sample size of the study was derived statistically from Taro Yamane formula. The sample size of the study was 262. The researcher adopted simple random sampling technique. The major research instrument for this study was a structured questionnaire which was developed by the researcher based on the reviewed related literature and the research questions which guided the study. The reliability test was conducted on the research instrument by administering 20 copies of the validated questionnaire to similar respondents in south East Nigeria. Thus, the reliability coefficients showed that the instruments were highly reliable and good for the study. The researcher adopted primary source of data, which was questionnaire to collect data from the respondents. Regression model and Pearson correlation coefficient were used to test the relationships between dependent and independent variables of the study. Two hundred and sixty-two (262) copies of questionnaire were distributed to proprietors/managers of selected SMEs in South-South, Nigeria. Eight (8) copies of questionnaire where wrongly filled and discarded with 3.1%. However, two hundred and fifty-four (254) copies of questionnaire were completed and returned, constituting 96.9% response rate.

Results

Research question one: What is the impact of innovation and technology adoption on the sustainability of SMEs in South South Nigeria?

Table 1: Respondents Mean Rating on innovation and technology adoption on the sustainability.

Statement	SA	A	UN	D	SD	∑F x	(x)	Remarks
1. The management supports ideas that lead to improvements	150	80	--	14	10	1108	4.4	Agreed
2. Innovation is actively encouraged at all levels of the organization.	175	58	7	21	--	1170	4.6	Agreed
3. Organization regularly develops new products/services.	165	50	9	10	20	1092	4.3	Agreed
4. Organization adopts new technologies faster than competitors.	144	78	15	17	--	1111	4.4	Aagreed
5. Employees are skilled in using modern technologies	150	80	--	14	10	1108	4.4	Agreed
6. Technology adoption has improved our productivity	140	75	15	24	--	1093	4.3	Agreed
7. Sustainable practices have improved our organizational performance.	178	41	9	16	10 --	1123	4.4	Agreed
8. Innovation and technology adoption contribute positively to our long-term growth	165	59	--	10	20	1101	4.3	Agreed
9. Pressure from stakeholders, customers, and regulatory bodies to adopt sustainable practices.	144	70	15	17	8	1087	4.3	
Cluster mean							4.4	Agreed

Source; Field Survey, 2026

The decision rule mean score of $\underline{x}$ 3.00 was used to take decision on the 5-point likert scale statements. Statements below $\underline{x}$ 3.00 were rejected otherwise was accepted. The table presents respondents' perceptions regarding innovation and technology adoption as determinants of sustainability. The findings indicate that respondents generally agreed with all the statements, as evidenced by mean scores ranging from 4.3 to 4.6, all exceeding the acceptance criterion of 3.00. The highest mean score (4.6) was recorded for the statement "Innovation is actively encouraged at all levels of the organization," indicating a strong consensus that organizations foster a culture of innovation across different operational levels. This suggests that employees perceive innovation

as an integral part of organizational activities. The statements "The management supports ideas that lead to improvements," "Organization adopts new technologies faster than competitors," "Employees are skilled in using modern technologies," and "Sustainable practices have improved our organizational performance" each recorded a mean score of 4.4, indicating that respondents agree that management commitment, technological competence, and sustainability initiatives positively influence organizational outcomes. Similarly, the statements "Organization regularly develops new products/services," "Technology adoption has improved our productivity," "Innovation and technology adoption contribute positively to our long-term growth," and "Pressure from stakeholders, customers, and regulatory bodies to adopt sustainable practices" each recorded a mean score of 4.3. These findings suggest that respondents acknowledge the role of innovation and technological advancement in enhancing productivity, promoting long-term growth, and driving sustainability efforts through external stakeholder influence. The overall cluster mean of 4.38 indicates a high level of agreement among respondents that innovation and technology adoption are critical factors in enhancing sustainability. This implies that organizations that encourage innovation, invest in modern technologies, and embrace sustainable practices are more likely to achieve improved performance, productivity, competitiveness, and long-term growth. Therefore, innovation and technology adoption can be regarded as significant drivers of sustainability within organizations.

Hypothesis One:

$H0_1$: There is no significant difference between innovation and technology adoption on the sustainability of SMEs in South South Nigeria.

Table 2: Regression analysis on innovation and technology adoption on the sustainability of SMEs

Model	Unstandardized Coefficients	Standardized Coefficients		T	
	B	Std. Error	Beta		Sig
(Constant)	0.675	0.852		0.792	0.000
ITA	0.402	0.151	0.154	2.662	0.005
R^2	0.702				
R^{-2}	0.661				
F	8.630				

Source: Field Data, 2026

The regression result shows that innovation and technology adoption (ITA) significantly and positively influence the sustainability of SMEs. The model explains a strong proportion of variation in sustainability ($R^2 = 0.702$; Adjusted $R^2 = 0.661$), meaning about 70.2% of changes in SME sustainability are explained by ITA. The model is statistically significant ($F = 8.630$). The coefficient for ITA ($B = 0.402$, $p = 0.005$) indicates that an increase in innovation and technology adoption leads to an improvement in SME sustainability. This confirms that innovation and technology adoption significantly enhance the sustainability of SMEs. This implies that there is a significant difference between innovation and technology adoption on the sustainability of SMEs in South South Nigeria.

Research question Two: What is the impact of business models on sustainability of SMEs in South South Nigeria?

Table 3 Respondents Mean Rating on business models on sustainability of SMEs

Statement	SA	A	UN	D	SD	∑F x	(x)	Remarks
10. Waste reduction practices have improved our business efficiency.	94	75	10	29	10	868	3.4	Agreed
11. Offering services instead of products improves resource efficiency.	178	50	--	16	10 -	1132	4.5	Agreed
12. Products/services are designed to reduce environmental impact.	105	92	27	10	20	1014	3.9	Agreed
13. Organization develops new solutions to address environmental challenges.	144	78	15	17	- -	1111	4.4	Agreed
14. We provide services that allow customers to access our products without buying them.	122	93	--	25	14	1046	4.1	Agreed
15. Ensuring fair labor practices, ethical sourcing, community engagement, and improving quality of life for stakeholders.	145	69	10	10	20	1071	4.2	Agreed
16. The company tracks sustainability performance across its supply chain	94	75	10	29	10	868	3.4	Agreed
17. Investments in renewable energy have improved our sustainability performance.	124	95	30	5	- -	1100	4.3	Agreed
18. Employee welfare and safety are prioritized in business operations.	200	46	8	- -	- -	1208	4.7	Agreed
19. Sustainability practices have strengthened stakeholder relationships.	105	92	7	17	20	968	3.8	Agreed

20. Employee welfare and safety are prioritized in business operation	124	78	15	17	20	1031	4.1	Agreed
Cluster mean							4.1	Agreed

Source; Field Survey, 2026

The table presents respondents' opinions on how sustainable business models influence the sustainability of SMEs. All the individual mean scores range from 3.4 to 4.7, which are above the benchmark mean of 3.00. This indicates that respondents generally agreed with all the statements. The highest mean score (4.7) was recorded for the statement "Employee welfare and safety are prioritized in business operations", suggesting a very strong consensus that social sustainability practices are important within SMEs. Other highly rated items include offering services instead of products to improve resource efficiency (4.5), developing solutions to address environmental challenges (4.4), and investments in renewable energy improving sustainability performance (4.3). These findings show that respondents perceive innovative and environmentally conscious business practices as key contributors to sustainability. Moderately high mean scores were observed for fair labor practices, ethical sourcing, and community engagement (4.2), as well as customer access models and employee welfare initiatives (4.1 each). This implies that stakeholders believe social responsibility and alternative service-based business models enhance SME sustainability. The lowest mean scores (3.4) were recorded for waste reduction practices improving business efficiency and tracking sustainability performance across the supply chain. Although respondents still agreed with these statements, the relatively lower ratings suggest that these practices may be less developed or less visible within the surveyed SMEs. Overall, the cluster mean of 4.07 indicates a strong level of agreement among respondents that sustainable business models positively influence the sustainability of SMEs. The result suggests that SMEs that adopt resource-efficient practices, environmentally friendly innovations, renewable energy investments, ethical labor practices, and stakeholder-oriented strategies are more likely to achieve long-term sustainability and improved organizational performance.

Hypothesis two:

$H0_2$: There is no significant difference between business models and sustainability of SMEs in South South Nigeria.

Table 4: Regression analysis on between business models and sustainability of SMEs in South South Nigeria.

Model	**Unstandardized Coefficients**	**Standardized Coefficients**		**T**	
	B	Std. Error	Beta		Sig
(Constant)	0.825	0.782		1.055	0.003
BM	0.152	0.121	0.177	1.26	0.004
R^2	0.682				
R^{-2}	0.588				
F	7.390				

Source: Field Data, 2026

The regression result shows that business models (BM) have a positive and significant effect on the sustainability of SMEs in South-South Nigeria. The model explains a substantial proportion of the variation in sustainability ($R^2 = 0.682$; Adjusted $R^2 = 0.588$), meaning about 68.2% of changes in SME sustainability are explained by business models, while the remaining variation is due to other factors not included in the model. The overall model is statistically significant ($F = 7.390$), indicating a good fit. The coefficient for business models ($B = 0.152$, Beta = 0.177, $p = 0.004$) shows that business models have a positive and statistically significant relationship with SME sustainability. This implies that improvements in business model practices lead to an increase in sustainability performance, although the effect size is relatively modest. The findings confirm that business models significantly contribute to the sustainability of SMEs in South-South Nigeria. This implies that there is a significant difference between business models and sustainability of SMEs in South South Nigeria.

Summary of The Findings

The findings of the study were summarized as follows:

i. There was a significant difference between innovation and technology adoption on the sustainability of SMEs in South South Nigeria.

ii. There was a significant difference between business models and sustainability of SMEs in South South Nigeria.

Discussion of The Findings

The findings were discussed as follows:

Impact of innovation and technology adoption on the sustainability of SMEs in South South Nigeria.

The result of the study relating to objectives one which sought to evaluate the impact of innovation and technology adoption on the sustainability of SMEs in South South Nigeria. The result revealed that There is a significant difference between innovation and technology adoption on the sustainability of SMEs in South South Nigeria, with the result showing a positive significance effect of ($0.005 < 0.05$) on innovation and technology adoption leads to an improvement in SME sustainability. This finding is in accordance with the research findings of Solomon & Nicholas (2022) revealing that found sectoral differences in innovation adoption; factors influencing entrepreneurship development vary by environment. Megat, Hadijah & Noraini (2025) Innovation positively influences performance; some innovation dimensions insignificant

Impact of business models on sustainability of SMEs in South South Nigeria.

The result of the tested hypothesis two which was to assess the impact of business models on sustainability of SMEs in South South Nigeria. The result from the analysis of the study revealed that there was a significant difference between business models and sustainability of SMEs in South South Nigeria, showing the result having a with the result showing a positive significance effect of 0.004 ($p<0.05$) on business models and sustainability. This result is in an agreement with the research findings of Uloko (2019) early formal planning accelerates profitability; late informal planning also improves outcomes. Furthermore, the study of Irwan (2021) found that Good business planning and marketing strategies enhance MSME sustainability

Conclusion

This study has examined the critical role of innovation, technology adoption, and business model design in enhancing the sustainability of Small and Medium Scale Enterprises (SMEs) in South-South Nigeria. The findings underscore that in an increasingly dynamic and competitive business environment, SMEs can no longer rely on traditional methods of operation but must embrace continuous innovation, modern technologies, and adaptive business models to remain viable and competitive. The study reviewed that the sustainability of SMEs in South-South Nigeria is strongly dependent on the synergistic interaction between innovation, technology adoption, and business model adaptability. None of these factors operates in isolation; rather, their combined effect significantly determines the long-term survival and growth of SMEs. Therefore, the study concluded that for SMEs in the region to achieve sustainable development, there is a need for increased investment in innovation, improved access to affordable technologies, and continuous redesign of business models.

Recommendations

For innovation and technology adoption, and business model to make effective impact towards the sustainability of small and medium-scale enterprises (SMEs), the following recommendations were advanced:

i. SME owners and managers should increase investment in modern technologies such as digital platforms, cloud computing, automation tools, and business management software to improve operational efficiency, productivity, and long-term sustainability.

ii. SMEs owners should adopt innovative and flexible business models that can respond effectively to changing market conditions, customer preferences, and technological advancements.

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