

Reinventing Digital Inclusion to Promote a Sustainable Economy in Nigeria

Titilayo Shakirat Folarori

PhD student

Department of Business Administration, College of Management Sciences,
Bells University of Technology, Ota, Ogun State, Nigeria

folarorititilayo@gmail.com

Temitayo Alice Onifade

Associate Professor of Marketing

Department of Business Administration, College of Management Sciences,
Bells University of Technology, Ota, Ogun State, Nigeria

taonifade@bellsuniversity.edu.ng

Abstract

This study investigated digital inclusion to promote a sustainable economy in Nigeria. The objectives are to ascertain the relationship exists between digital entrepreneurship, digital financial services and technology adoption. Data were collected from primary sources using a questionnaire survey, administered to academic staff of selected private universities in Ogun State Nigeria. A simple random sampling technique was adopted for the study. A total of three hundred and thirty-two copies of the questionnaire were distributed to the selected respondents as arrived at using the Taro Ya-mane formula. Questionnaires were successfully retrieved from the respondents and analyzed using the statistical package for social sciences (SPSS). The hypotheses of the study were tested using the multiple regression analysis to determine whether to accept or reject the null hypotheses (H₀). The study tested three hypotheses on the role of digital transformation in promoting a sustainable economy. Results from regression analysis revealed that digital entrepreneurship ($B = 0.318$, $p < 0.001$), digital financial services ($B = 0.274$, $p < 0.001$), and technology adoption ($B = 0.292$, $p < 0.001$) each had positive and statistically significant effects on sustainable economy. From the findings of the study, it was recommended that entrepreneurs should encourage the adoption of digital tools to improve productivity, institutions should provide access to digital investment platforms that allow small-scale investments, offering opportunities for wealth accumulation, government and institutions should integrate digital literacy into the school curriculum to ensure that young people in rural areas develop these skills from an early age, lastly community leaders and stakeholders should plan and implement digital initiatives to ensure they meet the community's needs.

Keywords

Digital inclusion, sustainable economy, Digital Entrepreneurship, Digital Financial service, Technology adoption

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Introduction

Sustainable development is the process of expanding the group of people's choices, then sustainability is the development of a person and his capabilities, regardless of gender (Ashami & Nuri, 2019). Trade, production, labour, and service delivery are all undergoing fast-paced digital transformation, which is quickly being acknowledged as essential to growth (World Bank, 2016). How to ensure that everyone can meaningfully benefit from digital technologies has been a key subject in the discussion of how to achieve digital inclusion. Two significant changes have occurred in the long-standing literature on digital inclusion: first, the focus on differential access/usage rates has expanded to include quality of access/use, affordability, and digital skills.

Second, the internet has become the focal point, with mobile phones receiving most of the earlier attention (at least in developing countries); the internet has been dubbed «the single most important general-purpose technology of recent times» (Bauer & Latzer, 2016). Development is frequently described as a process as opposed to a finished good. This means that no country can say that it has reached the apex of its growth process at this point; rather, every country is always working to advance to a higher, better, and more sustainable level (Angalapu & Ikporukpo, 2019).

The Sustainable Development Goals (SDGs) were formally agreed upon by the United Nations General Assembly and member States in September 2015. The 2030 Agenda for Sustainable Development is a global development agenda centered on «economic prosperity, social inclusion, and environmental sustainability» (United Nations, Department of Economic and Social Affairs, 2018; Ifla Wlic, 2019). The UN's Broadband Commission for Sustainable Development was created in 2010 by the International Telecommunication Union (Itu) and the United Nations Educational, Scientific, and Cultural Organization (Unesco) in response to this development. Its mission is to promote the development and empowerment of all individuals and society by utilizing the benefits of broadband (UNESCO, 2019).

The existence and impact of the digital economy support sustainable economies; in comparison to traditional economies, the digital economy has improved economic efficiency, improved the structure of the economy, and is strongly interwoven with the actual economy (Gao et al., 2022; Niu et al., 2024).

According to Sahut et al. (2019), digital entrepreneurship refers to the process of taking an entrepreneurial initiative to produce digital value by utilizing a variety of socio-technical digital facilities to enable effective digital information processing, dissemination, and consumption. Rural people's entrepreneurial behaviour has improved as a result of digital financial services, which has helped to equalize entrepreneurial chances and lessen the gap between urban and rural areas (Xie et al., 2020; Li, 2024). The connections between interregional and urban-rural economic activity have also been reinforced by the spread of digital technologies. The research on the 5As of the technology access framework by Roberts and Hernandez (2019) identifies availability, affordability, ability, awareness, and accessibility as the five main categories of barriers to technology adoption that impact technology access. These obstacles may make it difficult to access mobile phones and the Internet. Moreover, the availability of mobile phones and the Internet does not guarantee their utilization for particular purposes (such as social media or text messaging).

The potential advantages of the internet for development have been the subject of much conjecture in recent decades. However, reliable estimates of how internet access affects developing nations causally have just lately surfaced in the literature. Studies conducted recently on developing nations have shown that these initiatives have a major positive impact on public service delivery, health, education, labour markets, democracy, and financial inclusion as well as on poverty reduction (Hjort & Tian, 2021; Zhuravskaya et al., 2020). It has also become more evident that poor nations cannot benefit from digital technologies, trade in services, or make the shift to knowledge-based economies without dependable and fast internet connectivity.

According to the research, there are numerous measurement problems with validity and reliability when it comes to the data on digital inclusion that are currently accessible. It also makes the case that, despite (inadequate) attempts to gauge internet affordability and access, other crucial elements of digital inclusion, such as digital entrepreneurship, digital financial services, barriers to technology adoption and benefits of digital inclusion, have not gotten the attention they merit. The main contention is that, despite significant efforts to harmonize questions about digital inclusion for use in representative surveys in developing nations, survey designers should be mindful that the technology may be utilized in specific ways in these nations that are not adequately represented by questions directly lifted from surveys conducted in high-income nations. Lastly, the report argues that, in addition to cross-country disparities, measuring initiatives and progress targets linked to digital inclusion should take a more holistic approach by taking into account the sustainable economy inside each nation. The extent to which digital inclusion promotes a sustainable economy in Nigeria remains undetermined. This research was conducted to address this knowledge gap.

Research Question

- i. Does digital entrepreneurship play a role in fostering sustainable economy?
- ii. Does access to digital financial services contribute to sustainable economy?
- iii. What are the barriers to technology adoption on sustainable economy?

Research objective

- i. Ascertain the impact between digital entrepreneurship and sustainable economy.
- ii. Assess the effect of digital financial services and sustainable economy.
- iii. Examine the influence of technology adoption and sustainable economy.

Literature Review

Conceptual Clarifications

• Digital Inclusion

In order to fully engage in social, economic, and civic life, people must be able to access and use digital technologies, such as the internet and mobile devices (UNESCO, 2019). This is known as digital inclusion. The phrase is defined by Morte-Nadal and Esteban-Navarro (2022) as providing information and communication technologies knowledge and use to those who do not currently have it. Digital inclusion is a multifaceted notion that includes digital literacy and skills, internet connectivity and device access, as well as the availability of pertinent digital information and services (European Commission, 2019). Digital inclusion is critical to recognize that indigenous peoples who live in rural areas adapt and utilize digital technology in ways that are appropriate for their unique social environments. Digital inclusion in rural areas has always been a global struggle. Campbell-Meier et al. (2020) attribute this to the fact that indigenous peoples were often generalized and their experiences were assumed to be universal at the national, continental, or regional levels, where Internet access is prioritized above trust, motivation, and skill development. According to Adam and Dzang Alhassan (2021), the promotion of digital inclusion is contingent upon the utilization of information communication technology, rather than the availability of such technology itself. Thus, when people learn how to utilize them successfully, digital inclusion can be attained and the digital divide can be closed.

Digital inclusion is the full use of technology to support work, a better quality of living, social interaction, and social integration, using technology breakthroughs for learning and academic performance will likely lead to personal achievement for pupils on an individual basis, by cutting the price of delivering public services, corporations and organizations can benefit their clientele.

Digital inclusion in the public sector is applicable to the digitization of health services as well as perhaps saving money, because technology allows people to express themselves and communicate with one another, digital inclusion may enhance social engagement and integration in communities (Noh, 2019).

According to [GOV.UK](#) (2014), digital inclusion is a component of social inclusion since it gives people the proper access to the digital world for intellectual growth and creates venues for important cultural practices that enable people to be digitally literate. It went on to say that being digitally inclusive meant having the ability to create and produce meanings and emotions in cyberspace in addition to having the technological ability to operate in it. Digital inclusion, according to GOV. UK, is also the capacity to use ICT to access, modify, and produce new information. Being digitally inclusive means being able to navigate the ICT environment both technically and operationally. Four categories of physical resources are crucial to digital inclusion (computers and connectivity), digital (online access to digital materials), and human (literacy and education), societal (structures of society and institutions of communication). It is not impossible to implement and make digital inclusion a reality if these resources are well-aligned. Four forms of capital are the source of the digital inclusion process: social (their power and identity in politics), intellectual (capacity on an individual basis), cultural (a society's memory), technological (ability to act and communicate).

• Digital Entrepreneurship

Innovative ventures significantly contribute to the development of complete economic development in all nations. Entrepreneurship is regarded as one of the significant and promising fields in the economies of both developed and developing nations. These initiatives are also regarded as the foundation for developing both small and large corporate entities (Al-Najjar & Al-Ali, 2019).

The world of investment is undergoing rapid development today, with entrepreneurs serving as one of its main drivers. This is evident in the trend toward entrepreneurship and its many applications across a range of industries. Entrepreneurship is defined as any activity that focuses on starting a new business project, adds additional economic effectiveness by using resources wisely, and introduces or creates new administrative and economic activities (Al-Shamimary & Al-Mubarik, 2019).

A subset of entrepreneurship known as «digital entrepreneurship» involves using digital media and technologies to digitize all or part of what would otherwise be physical in traditional settings (Davidson & Vaast, 2010). It can also refer to the launch of new ventures and the transformation of already-existing companies via the development of new digital technologies or the experimentation with new ones (Zhao & Collier, 2016).

All new ventures and business transformations that drive economic and social value through the development and application of new digital technologies, new business, improving business intelligence, and engaging with stakeholders and customers are considered forms of digital entrepreneurship. These endeavors also create future growth prospects and jobs (Zhao & Collier, 2016).

• Digital Financial Service

According to Ramli (2020), there is still diversity in the definition of digital finance services among academics and practitioners. Different governments and monetary authorities have different perspectives on what constitutes digital finance, and this includes the way payment data is classified, with some still integrating it with electronic transactions. According to Durai and Stella (2019), digital finance involves the provision of financial services through mobile devices, computers, the internet, mobile wallets, e-wallets, credit cards, and debit cards.

Digital financial services, as defined by Pazarbasioglu et al. (2020), are financial services (like payments, remittances, and credits) that can be accessed and sent through digital channels, such as mobile devices and pre-existing instruments (like debit and credit cards) that are primarily provided by banks. In the meantime, digital finance, as defined by Ozili (2018), is any combination

of infrastructure, technology, services, and/or products that allow people and businesses to access credit, savings, and payment options online without having to deal with financial service providers directly or visit bank branches.

The latest technical advancements have led to the inclusion of financial technology (fintech) in the category of digital finance. Fintech provides a range of investment products, including equities, commodities, financial derivatives, and digital gold, which is a type of gold. In addition, fintech companies operate as a financial marketplace, coordinating crowdfunding and peer-to-peer lending to facilitate direct connections between lenders and borrowers. This role in the financial marketplace is still up for debate as a digital financial tool that promotes financial inclusion.

Technology Adoption

Since technology makes it possible for organizations to operate more effectively and efficiently, it is one of the most crucial components of their competitiveness in the modern business world. Businesses will fall behind their rivals if they don't use technology (Cotera et al., 2015). However, adopting and successfully implementing ICTs presents a variety of problems for micro, small, and medium-sized organizations. These possible downsides can be attributed in part to the technology and in part to the sector in which they are used (AlBar & Hoque, 2019).

In addition to lowering transaction costs and accelerating business-to-business and business-to-consumer commercial transactions, ICT can enhance all facets of knowledge and information management within a corporation. On the other hand, the adoption of this kind of technology boosts the productivity of the business, the efficacy of specific operations, the creation of new markets and business models, and the quality of services offered to clients and assist in the enhancement of external communications. Additionally, by focusing human resources, it increases efficacy and efficiency (Thrassou et al., 2020). Since MSMEs play a significant role in any economy, they should be aware that expanding their customer base will enable them to earn profits that will not only benefit them directly but also aid in the nation's economic development (Ramdani et al., 2022; Tan et al., 2010).

Sustainable Economy

An economy that can maintain a high standard of living for the general public is considered sustainable. Economic sustainability is predicated on societal well-being. Three factors can be used to assess well-being. (Economic) This component consists of employment, income, and economic stability. (Investments) Developed by policies and programs that guarantee the welfare and advancement of society, these sectors include infrastructure, health, and education. (Consistency) the three elements of equality, a robust civil society, and impartially sound government are highlighted as having a favorable effect on the prospects of social integration. Development that can meet the needs of the modern society is called sustainable development. Meeting these demands, though, shouldn't jeopardize the capacities of coming generations. In order to achieve universally improved welfare and planet protection, sustainable development must address all issues related to poverty eradication, economic growth, health care, education, employment, social protection, and climate change as well as the preservation of the environment and ecology. The identification of expanding environmental issues that pose a threat to society's ability to sustain economic growth and necessitate all-encompassing, creative solutions at the national and supranational levels is linked to the introduction of the concept of sustainable development into international practice. In order to meet society's ever-increasing needs, a sustainable economy envisions the expansion of public infrastructure and requires substantial investment. However, it is evident that investment on its own cannot guarantee the sustainable development of States. Instead, an integrated approach is required to take into account all current paths of progress towards sustainable development, investigate the potential and importance of each of these paths, and evaluate the financial implications of introducing new forms and instruments that enhance the well-being of all societal segments and foster the growth of a sustainable economy. (Boston Consulting Group, 2018)

Nigeria and Digital Inclusion

The technological facilities in Nigeria, comprising 36 states and 774 local government council areas, are only available in urban areas at exorbitant costs that are affordable for the middle and upper classes of society. As a result, many rural and suburban areas are unable to fully participate in the emerging information economy. The concept of digital inclusion is based on three consecutive categories: infrastructure (network indicators and indices), utilization (technological usage and quality), and the digital divide opportunity (accessibility and affordability). Nigeria is one of the nation's having a low score on the digital opportunity index. Nigeria was rated 31st in Africa according to the International Telecommunication Union's digital opportunity index scores, which were 0.41, 0.03, and 0.01 for opportunity, infrastructure, and utilization, respectively (International Telecommunication Union, 2015).

The improvements in global technology have led to a widening of the digital divide or technology gap in Nigeria. This gap encompasses several factors such as internet access, computer literacy, and skills required to traverse the digital world. Nigeria and other developing countries are struggling to catch up, owing to weak ICT infrastructure, while developed nations are developing new technologies that will drive the digital age. For example, the majority of discussions in the global broadband industry center around 5G and its many benefits; however, Nigeria's efforts to fully realize the potential that comes with 5G continue to lag behind because of the low rate of smartphone penetration in the nation, which is caused by poverty, illiteracy, and ignorance. According to the most recent data from the Nigerian Communications Commission (NCC), as of December 2023, 57.84 percent of Nigeria's 224.7 million mobile subscriptions were on 2G networks, indicating that 2G technology remains the industry leader in the country's mobile market. Despite ongoing network improvements by telecom companies like MTN, the survey showed that only 31.33 percent of those subscriptions were on 4G, 9.80 percent were on 3G, and 1.04% were on 5G. This indicates that smartphone ownership is low in the nation. A 2023 research by DataReportal indicates that there are 122.5 million internet users in Nigeria, based on a population of approximately 211 million, and that between 11.8 and 18.9 percent of Nigerians have access to smartphones. This is despite the fact that MTN Nigeria's CEO, has stated that one barrier to digital inclusion in Nigeria is the high price of cell phones. For example, in November 2023, 5G-enabled smartphones became more widely available in Nigeria, providing high-speed connectivity. However, the cost of these smartphones, which can range from N120,000 to over N2 million, is significantly higher than what the 88.4 million Nigerians living in extreme poverty can afford (Ibeh, 2023).

Theoretical Review

Social Inclusion Theory

According to Foster and Seth (2014), social inclusion theory highlights the requirement of providing everyone with equal opportunity to engage in society and have access to resources that are essential to their well-being, regardless of their social, economic, or cultural background. A state's adoption of social inclusion is based on the neoliberal ideology that gained popularity in the 1980s. Neoliberal ideology holds that closing the skills gap and investing in human capital are necessary steps toward increasing social inclusion and advancing economic growth. This is being done as part of a nationalist push to boost the economy of the nation in order to increase its competitiveness in the international market. A number of social groups are included in social inclusion: gender, children, youth, health, culture, socioeconomic status, and religion, to name a few.

Digital Divide Theory

According to Van Dijk (2019), inequality served as the foundation for the digital divide theory. This theory defines inequality as differences in participation, skills, and digital literacy. The term «digital divide» refers to the division that exists between individuals who possess and utilize information and communication technologies and those who do not. The definition of the digital divide, as

agreed upon by Esteban-Navarro et al. (2020), is based on three aspects of inequality: inequality in opportunities for technological access and connectivity to devices and networks, including the internet and, more recently, inequality in the digital competencies required for using ICT in complex situations like business, education, and e-commerce. In contrast to 28% of homes in urban areas, just 6.3% of households in rural Africa have access to the Internet at home, according to ITU (2020).

Empirical Review

Williams (2023) examines how financial inclusion and innovations in digital business have affected Nigeria's economic growth, following the development of financial inclusion programs and the contribution of digital technologies to economic advancement. The report highlights obstacles to digital banking adoption in Nigeria, including disparities in access to digital technologies, regulatory obstacles, and the absence of traditional bank accounts in some groups of people. In order to promote a more equitable digital banking environment, Williams recommends quickening the development of financial infrastructure and modifying regulatory frameworks.

The goal of Al-Nesour and Khleifat's (2020) study was to determine the relationship and impact between digital entrepreneurship as an independent variable and organizational performance as a dependent variable by applying digital entrepreneurship to high performance in industrial companies. The findings of the study showed that applying digital entrepreneurship in its dimensions to organizational performance as measured by the balanced scorecard in industrial companies had a statistically significant effect, and that the two areas with the greatest impact on organizational performance were digital knowledge management and digital business environment management, which also strengthened the capacity centers of research and development departments by the departments of industrial companies in order to obtain sufficient financial funding to improve the competitiveness of companies and customer satisfaction.

The study conducted by Awawdeh et al. (2022) sought to determine how digital entrepreneurship affected digital supply chains and how business intelligence applications mediated this relationship. The study measured digital entrepreneurship using three dimensions and supply chains using four. The most noteworthy findings of the study indicated that business intelligence applications played a significant role as an intermediary variable in digital supply chains, and it recommended that digital entrepreneurship be enhanced by emphasizing the organization's overall perspective and its surroundings, the need to fully utilize the elements of digital entrepreneurship such as directing digital creativity to study the internal and external environment and its impact on the surrounding external variables in order to face potential threats, whether the external environment brings opportunities and challenges or the internal environment focuses on strengths and weaknesses.

According to a Pew Research Center study from 2019, rural residents are less likely than urban residents to have access to broadband internet because they have lower levels of digital use and skills. Moreover, one of the main obstacles to digital inclusion in Nigeria's rural areas is the lack of access to digital devices and internet connectivity, as found by Akpan-Obong (2020). The report also concludes that in order to close the digital divide, additional digital literacy training programs are required in rural areas.

Zhang et al. (2022) study looked at how digital technology affects national entrepreneurship as well as how it interacts with other ecosystem components. According to their study's empirical findings, the output of national entrepreneurial ecosystems is positively correlated with the degree of digital technology, and this correlation is stronger in countries with supportive cultures, reputable institutions, encouraging laws, easily accessible resources, and developed service sectors. These results highlight the significance of digital technology and offer new perspectives on the causal mechanisms and interdependencies among components of national entrepreneurial ecosystems.

Digital technology improves the connections between various ecosystem actors and modifies the nature of interactions among actors in the business ecosystem, according to studies on the entrepreneurial ecosystem, as noted by Bouncken and Kraus (2021). From the foregoing, it can

be concluded that digital technologies are creating new opportunities for entrepreneurs to take advantage of in addition to altering the manufacturing, marketing, and distribution of goods and services.

Lyons, et al. (2020) used data from the 2017 Inter Media Financial Inclusion Insights surveys to examine the relationship between poverty, financial inclusion, and digital inclusion across seven developing nations in South Asia and Sub-Saharan Africa in order to understand the impacts of these factors on poverty in these regions. They found a strong correlation between improvements in a number of financial and digital inclusion parameters and a significant decline in poverty, notably food insecurity.

Akinwale et al.'s (2020) study explores how mobile phones help to foster digital inclusion in Nigeria's rural communities. It is found that mobile phones play a crucial role in promoting digital inclusion in rural areas by giving users access to services and information like e-commerce, mobile banking, and agricultural data. The report recommends that programs and policies be created to encourage the usage of mobile phones and related applications in rural areas. Many Nigerians benefit from information exchange for social and commercial activities, more productivity, and better information access thanks to mobile phones, which promote digital inclusion. Mobile users can reduce transaction, communication, and travel expenses by utilizing these services.

Bello, et al. (2021) discovered in another study that social and cultural elements like gender norms, religious convictions, and community values have a significant role in determining digital inclusion in rural Nigerian communities. The study suggests that in order to address these social and cultural barriers and encourage gender equality and social inclusion in the adoption of digital technology, policies and programs should be created.

In order to investigate the relationship between advancements in ITC and financial inclusion, Beyene and Makina (2019) used cross-sectional data from 168 countries, 48 of which are in Africa. They discovered that technology, in particular internet access and ATMs, could significantly improve both access and use of financial services, which, in turn, would positively affect the socioeconomic scope in communities.

A key obstacle to digital inclusion in rural areas, according to a different study by Idowu et al. (2020), is a lack of knowledge about the advantages and applications of digital technology. It has been discovered that the high cost of digital devices and internet connectivity has an impact on digital inclusion in Nigeria's rural communities. Digital gadgets like laptops and cellphones are too expensive for many rural households to purchase, and the issue is made worse by the high cost of internet access. According to Ojebisi et al. (2019), policies and programs should be developed to lower the cost of digital devices and internet connectivity for rural people. They also assert that affordability is a major barrier to digital inclusion in rural areas.

Methodology

The study was carried out using descriptive research design which is sometimes called survey design. The study was carried out in Ogun state, in Nigeria, which is divided into three senatorial districts (Ogun East, Ogun West and Ogun Central). This location was chosen for the research because of its cosmopolitan nature and it is easily accessible to prospective respondents. This design (descriptive design) is preferred because very large samples are flexible, making the results statistically significant even when analyzing variables of the research. This study employs a structured questionnaire as the primary instrument for data collection. The questionnaire consists of six sections covering demographic information, digital access and usage, affordability of digital tools, digital skills, outcomes of digital inclusion. Most items were measured on a five-point Likert scale, with a pilot test conducted to ensure clarity, reliability, and validity. Variables were measured through a structured questionnaire based on validated scales, measured on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Digital entrepreneurship was assessed with five items focusing on ICT-driven innovation, online business expansion, and creativity (Cronbach's Alpha = 0.86). Digital financial services were measured with five items on mobile money, online banking, and

access to credit ($\alpha = 0.83$). Technology adoption was captured with five items on ICT use, efficiency, and willingness to embrace innovations ($\alpha = 0.85$). The dependent variable, sustainable economy, was measured with six items reflecting economic resilience, inclusiveness, long-term growth, and environmental sustainability ($\alpha = 0.88$).

Respondents were drawn from three categories: academic staff, MSME owners, and rural households. The study covered the three senatorial districts of Ogun State, represented by Crescent University (urban, Ogun Central), Bells University of Technology (peri-urban, Ogun West), and Babcock University (semi-rural, Ogun East). A total of 332 respondents were targeted, consisting of 146 academic staff, 98 MSMEs, and 88 rural households. Stratified sampling was used, with random and systematic selection methods applied within each stratum.

Data were analyzed using descriptive statistics, and regression analysis to identify predictors of digital inclusion outcomes. Reliability was assessed through Cronbach's Alpha, while validity was ensured through expert review and factor analysis. Ethical considerations including informed consent, confidentiality, and voluntary participation was strictly upheld.

Results

The study employed the Statistical Package for Social Sciences (IBM-SPSS, version 27). Data was analyzed in two forms, namely descriptive and inferential. Descriptive statistics was used to analyze the respondents' socio- demographic characteristics while the inferential statistics, multiple regression analysis were used to test the three hypotheses in the study. Prior to that, preliminary analysis such as missing data screening, univariate and multivariate normality tests were also performed on the data and they were within the acceptable threshold.

Descriptive Analyses of Participants' Demographic Characteristics

A total of 332 participants responded to the survey. Their demographic characteristics are summarized below.

Table 1: Demographic Characteristics of Respondents (N = 332)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	176	53.0
	Female	156	47.0
Age Group	18–25 years	64	19.3
	26–35 years	122	36.7
	36–45 years	82	24.7
	46 years and above	64	19.3
Educational Level	Diploma/OND	46	13.9
	Bachelor's Degree	148	44.6
	Master's Degree	94	28.3
	Doctorate (PhD)	44	13.3
Occupation	Academic Staff	144	43.4
	MSME Owners	112	33.7
	Rural Households	76	22.9
Location	Ogun Central (Crescent)	112	33.7
	Ogun West (Bells Tech)	104	31.3
	Ogun East (Babcock)	116	34.9

Demographic variables: of the 332 respondents, 53% were male and 47% female, showing a relatively balanced gender distribution. The majority (36.7%) was within the age group of 26–35 years, while 24.7% were between 36–45 years. Younger respondents aged 18–25 years represented 19.3%, and those aged 46 years and above accounted for 19.3%.

Regarding education, most respondents held a bachelor's degree (44.6%), followed by master's degree holders (28.3%), doctorate degree holders (13.3%), and diploma/OND holders (13.9%). In terms of occupation, academic staff constituted the largest group (43.4%), followed by MSME owners (33.7%) and rural households (22.9%). Geographically, participants were fairly distributed across Ogun State: 33.7% from Ogun Central, 31.3% from Ogun West, and 34.9% from Ogun East.

Regression Analysis

To test the study objectives, a multiple regression model was employed. The dependent variable is Sustainable Economy, while the independent variables digital inclusion (Digital Entrepreneurship, Digital Financial Services, and Technology Adoption). The model specification is given as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \epsilon$$

Where:

- Y = Sustainable Economy
- X_1 = Digital Entrepreneurship
- X_2 = Digital Financial Services
- X_3 = Technology Adoption
- β_0 = Intercept
- β_1 – β_3 = Regression coefficients
- ϵ = Error term

Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	0.742	0.551	0.547		0.41235

The model summary shows that the multiple correlation coefficient (R) is 0.742, indicating a strong positive relationship between the predictors digital entrepreneurship, digital financial services, and technology adoption and the dependent variable, sustainable economy. The coefficient of determination (R Square) is 0.551, which means that 55.1% of the variance in sustainable economy can be explained by the predictors. The Adjusted R Square value of 0.547 suggests that after adjusting for the number of predictors and the sample size, the model still explains about 54.7% of the variance, indicating that the model is both stable and reliable. The standard error of the estimate is .41235, showing that on average, the model's predictions deviate from the observed values by about 0.41 units, which suggests relatively precise predictions.

ANOVA

Model	Sum Squares	df	Mean Square	F	Sig.
Regression	89.241	3	29.747	175.063	0.000b
Residual	72.379	328	0.221	Residual	
Total	161.620	331			

a. Dependent Variable: Sustainable Economy

b. Predictors: (Constant), Technology Adoption, Digital Financial Services, Digital Entrepreneurship

The ANOVA table tests whether the overall regression model is statistically significant. The regression sum of squares is 89.241 with 3 degrees of freedom, representing the variation in sustainable economy explained by the three predictors (digital entrepreneurship, digital financial services, and technology adoption). The residual sum of squares is 72.379 with 328 degrees of freedom, representing the unexplained variation. The total variation in the dependent variable is 161.620.

The mean square for regression is 29.747, while the mean square for residual is 0.221. Dividing the regression mean square by the residual mean square yields an F-statistic of 175.063, which is very high. The associated significance level (Sig.) is 0.000, which is less than 0.05, indicating that the overall model is statistically significant.

This result means that the combination of digital entrepreneurship, digital financial services, and technology adoption significantly predicts sustainable economy in Nigeria.

Coefficients

Predictor Variables	Unstandardized Coefficients (B)	Std. Error	Standardized Beta (β)	t-value	Sig. (p)
Constant	0.824	0.112	–	7.357	0.000
Digital Entrepreneurship (X_1)	0.318	0.051	0.362	6.235	0.000
Digital Financial Services (X_2)	0.274	0.047	0.311	5.872	0.000
Technology Adoption (X_3)	0.292	0.056	0.298	5.214	0.000

a. Dependent Variable: Sustainable Economy

The coefficients table provides information on the contribution of each independent variable to the prediction of sustainable economy. The constant (intercept) has an unstandardized coefficient (B) of 0.824, which is statistically significant ($t = 7.357$, $p < 0.001$). This indicates the baseline level of sustainable economy when all predictors are held constant.

For digital entrepreneurship (X_1), the unstandardized coefficient (B) is 0.318 with a standardized beta (β) of 0.362. This suggests that for every one-unit increase in digital entrepreneurship, sustainable economy increases by 0.318 units, holding other variables constant. The t-value of 6.235 and p-value of 0.000 indicates that this effect is statistically significant.

Digital financial services (X_2) has an unstandardized coefficient (B) of 0.274 and a standardized beta (β) of 0.311. This means that a one-unit increase in digital financial services leads to a 0.274 unit increase in sustainable economy, controlling for other factors. The effect is statistically significant ($t = 5.872$, $p < 0.001$).

Technology adoption (X_3) shows an unstandardized coefficient (B) of 0.292 and a standardized beta (β) of 0.298, indicating that a one-unit increase in technology adoption results in a 0.292 unit increase in sustainable economy. This predictor is also statistically significant ($t = 5.214$, $p < 0.001$).

Among the predictors, the standardized coefficients (β) show that digital entrepreneurship ($\beta = .362$) makes the strongest contribution to predicting sustainable economy, followed by digital financial services ($\beta = .311$) and technology adoption ($\beta = .298$).

Hypothesis one: H_1 : Digital entrepreneurship has a significant impact on sustainable economy.

The regression results support this hypothesis. Digital entrepreneurship had a positive and statistically significant effect on sustainable economy ($B = 0.318$, $\beta = 0.362$, $t = 6.235$, $p < 0.001$). This implies that an increase in digital entrepreneurship activities significantly contributes to the promotion of a sustainable economy, hence, H_1 is accepted.

Hypothesis Two: H_2 : Digital financial services significantly affect sustainable economy.

This hypothesis is also supported by the findings. Digital financial services demonstrated a positive and significant effect on sustainable economy ($B = 0.274$, $\beta = 0.311$, $t = 5.872$, $p < 0.001$). This suggests that improved access to and usage of digital financial services enhance economic sustainability by facilitating inclusiveness and equal opportunities. Thus, H_2 is accepted.

Hypothesis Three: H_3 : Technology adoption significantly influences sustainable economy.

The results show a significant positive effect of technology adoption on sustainable economy ($B = 0.292$, $\beta = 0.298$, $t = 5.214$, $p < 0.001$). This means that greater adoption of digital technologies drives sustainable economic outcomes, confirming the importance of technology integration in fostering long-term development. Therefore, H_3 is accepted.

Discussion of Findings

The objective of this study was to investigate digital inclusion (digital entrepreneurship, digital financial services, technology adoption) and sustainable economy in Nigeria, using a sample of 332 respondents. The regression results revealed that all three predictors significantly and positively influenced sustainable economy.

Firstly, the findings confirmed that digital entrepreneurship significantly impacts sustainable economy. The results ($B = 0.318$, $\beta = 0.362$, $p < 0.001$) indicate that entrepreneurial activities enabled through digital platforms contribute to sustainable economic development. This finding aligns with Sahut et al. (2019), who emphasized that digital entrepreneurship creates digital value through socio-technical systems, enhancing innovation and inclusiveness. It also supports Xie et al. (2020),

who highlighted that digital opportunities reduce the urban–rural gap in entrepreneurial chances. In the Nigerian context, digital entrepreneurship provides avenues for job creation, scalability of small businesses, and integration into the global digital market, thereby driving sustainability.

Secondly, the study established that digital financial services significantly affect sustainable economy ($B = 0.274$, $\beta = 0.311$, $p < 0.001$). This implies that mobile banking, digital payments, and online financial platforms are instrumental in promoting inclusiveness and enabling economic participation across different socio-economic groups. The result is consistent with Li (2018), who noted that digital finance empowers rural and underserved populations by improving access to credit and financial literacy. Similarly, in sub-Saharan Africa, Tay et al. (2022) observed that digital financial inclusion has been a key enabler of sustainable growth through enhanced savings, investments, and entrepreneurial activities. Thus, the Nigerian digital financial ecosystem is critical for fostering economic resilience and reducing inequalities.

Thirdly, the findings revealed that technology adoption significantly influences sustainable economy ($B = 0.292$, $\beta = 0.298$, $p < 0.001$). This demonstrates that the integration of digital technologies such as e-commerce platforms, cloud systems, and ICT infrastructures plays a pivotal role in ensuring efficiency and sustainability in economic activities. The result corroborates Okpalaoka et al. (2022), who emphasized that technological innovation enhances organizational performance and long-term competitiveness. It also supports Rogers' Diffusion of Innovation theory, which posits that societies that adopt new technologies more rapidly experience accelerated development outcomes. For Nigeria, widespread adoption of digital technologies has the potential to transform production, distribution, and service delivery, ultimately strengthening sustainable economic systems.

Overall, the study confirms that digital entrepreneurship, digital financial services, and technology adoption collectively and individually drive sustainable economy in Nigeria. Among the predictors, digital entrepreneurship emerged as the most influential factor, underscoring the growing importance of entrepreneurial innovation in the digital age. This suggests that policies and interventions aimed at enhancing digital skills, expanding digital infrastructure, and improving access to finance will be crucial for Nigeria to achieve sustainable economic development.

Conclusion

This study assessed the influence of digital inclusion to promote a sustainable economy in Nigeria using regression analysis. The findings revealed that all three factors significantly and positively impact sustainable economic outcomes, with digital entrepreneurship exerting the strongest influence, followed by digital financial services and technology adoption.

The results highlight the importance of digital transformation as a key driver of sustainable economic development. Specifically, digital entrepreneurship creates opportunities for innovation, job creation, and inclusive participation in economic activities. Digital financial services enhance financial access and inclusivity, bridging the gap between urban and rural populations. Similarly, the adoption of digital technologies fosters efficiency, competitiveness, and long-term sustainability.

In conclusion, the study underscores that achieving a sustainable economy in Nigeria requires deliberate investment in digital skills, expansion of digital infrastructure, and supportive policies that promote entrepreneurship and financial inclusion. By leveraging digital opportunities, Nigeria can accelerate economic diversification, reduce inequalities, and build a more resilient and sustainable economy.

Recommendations

The study makes the following recommendation based on its findings;

- i. Entrepreneurs should encourage the adoption of digital tools and platforms that streamline operations, reduce costs, and improve productivity.

- ii. Institutions should provide access to digital investment platforms that allow small-scale investments, offering opportunities for wealth accumulation
- iii. Government and institutions should integrate digital literacy into the school curriculum to ensure that young people in rural areas develop these skills from an early age.

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