Impact of Global System for Mobile Communication (GSM) on the Development of Small-Scale Enterprises in Nigeria

Ugowe Samson Omoruyi [1], **Yusuff Taofiq Olasunkanmi** [2], **Gandonu Tosin Femi** [3], **Oladejo Babatunde John** [4], **Opeoluwa Olumakinwa Adebayo** [4], **Sharafadeen Ashafe Nurein** [5], **Bioluwatife Oluwaferanmi Oke** [6]

[1] *Irish University Business School*
7 Milltown Rd, Dublin, Ireland, UK

[2] *Yaba College of Technology*
Herbert Macaulay Road, Opposite WAEC office, Yaba, Lagos State, Nigeria

[3] *Olabisi Onabanjo University*
P. M. B. 2002, Ago-Iwoye Ogun State, Nigeria

[4] *Ogun State Institute of Technology, Igbesa*
P. M. B. 2005, Oba Adesola Market Road, Igbesa, 112102, Ogun State, Nigeria

[5] *University of Lagos*
101017 University Road, Akoka, Lagos State, Nigeria

[6] *Ekiti State University*
Ado Ekiti, 362103, Ekiti, Nigeria

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Corresponding Author:
Yusuff Taofiq Olasunkanmi
yusufftaofiq1@gmail.com

Abstract. The study investigates the impact of the Global System for Mobile Communication (GSM) on the development of small-scale enterprises (SSEs) in Nigeria, focusing on its role in driving economic growth and improving operational efficiency. Data were gathered from 40 payphone centre owners in Apapa through questionnaires using a cross-sectional survey design. Respondents' demographic data showed that 62.5% were female, 37.5% were male, and 45% fell within the 15–30 age group, indicating youth dominance in the sector. Results revealed that 80% of respondents agreed or strongly agreed that GSM has improved the standard of Nigerian small-scale enterprises. In comparison, 65% disagreed that GSM impacts only the Nigerian economy, not small-scale entrepreneurs.

Additionally, 72.5% strongly agreed that GSM has created job opportunities and helped reduce unemployment, further supported by findings that 57.5% strongly agreed GSM aids in crime reduction through better communication with security agencies. Despite these benefits, 70% of respondents cited high tariffs as a major barrier, negatively affecting profitability. The results underscore GSM's transformative impact on SSEs while highlighting the need for a unified tariff structure to maximise its potential for business growth and economic development.

Keywords: GSM Technology; Small-Scale Enterprises (SSEs); Economic Development; Mobile Communication Entrepreneurship in Nigeria.

INTRODUCTION

The Global System for Mobile Communication (GSM) technology has profoundly transformed the global communication landscape, particularly in developing economies like Nigeria. Since its introduction in 2001, GSM has played a critical role in bridging the communication gap, enhanc-

ing accessibility, and fostering socio-economic development. According to [1], mobile communication technologies have significantly accelerated the exchange of information and reduced transaction costs, stimulating growth in various sectors, including small-scale enterprises (SSEs). Small-scale enterprises are the backbone of most developing economies, contributing substantially to employment generation, poverty alleviation, and overall economic output [2]. However, the lack of adequate infrastructure, including effective communication systems, has historically hindered their potential. GSM technology presents a transformative solution, enabling small-scale enterprises to overcome traditional barriers to growth and productivity.

Small-scale enterprises in Nigeria operate in a highly competitive and resource-constrained environment, making effective communication a vital determinant of their success. The GSM revolution has enhanced the ability of these businesses to reach broader markets, maintain consistent customer relationships, and streamline supply chain operations [1]. Furthermore, integrating GSM technology into business operations has enabled real-time communication, access to market information, and the development of innovative business models. The proliferation of GSM technology has also facilitated financial transactions, with mobile banking and payment systems providing a lifeline to small businesses lacking access to traditional financial institutions [3]. This underscores the critical role of GSM in enhancing the operational efficiency of small-scale enterprises in Nigeria.

The significance of GSM technology in Nigeria's economy cannot be overstated. With over 200 million subscribers as of 2023, Nigeria ranks as one of the largest telecommunications markets in Africa [4]. This widespread adoption has enabled small-scale enterprises to thrive by leveraging mobile communication tools to achieve business goals. GSM technology has contributed to rural and urban connectivity, enabling businesses to expand beyond local markets and engage with national and international markets. Consequently, developing small-scale enterprises through GSM technology has become a focal point for policymakers and stakeholders seeking to stimulate inclusive economic growth in Nigeria.

The role of GSM technology in enhancing the productivity and profitability of small-scale enterprises is evident in its ability to facilitate customer relationship management (CRM). Small businesses often lack the resources to implement sophisticated CRM systems; however, GSM technology provides affordable and efficient tools for maintaining communication with clients and responding promptly to their needs. According to [5], mobile technologies have empowered businesses to personalise customer interactions, fostering loyalty and repeat patronage. This implies that GSM technology is not only a tool for communication but also a strategic asset for improving customer satisfaction and competitive advantage.

Despite the remarkable progress enabled by GSM technology, small-scale enterprises in Nigeria still face challenges that limit their full exploitation of these tools. Issues such as high service costs, poor network quality, and digital illiteracy among entrepreneurs remain significant barriers [6]. Addressing these challenges is essential to ensure that the benefits of GSM technology are equitably distributed across all sectors and regions. Moreover, the role of government and private sector players in creating a favourable environment for GSM-driven enterprise development cannot be overlooked.

The intersection of GSM technology and financial inclusion has also garnered attention in recent years. Small-scale enterprises in Nigeria often face difficulties accessing formal financial services due to stringent requirements and the limited reach of traditional banking systems [7]. GSM-enabled mobile banking platforms such as Paga and Opay have emerged as game-changers, providing small businesses access to financial services such as savings, loans, and payments. These platforms have not only improved financial inclusion but also enhanced the financial management capabilities of small-scale enterprises.

Additionally, GSM technology has revolutionised marketing strategies among small-scale enterprises. Businesses can reach a wider audience at minimal costs through social media platforms, bulk SMS services, and mobile advertisements. According to [8], mobile marketing has provided small businesses with an affordable alternative to traditional advertising channels, often out of reach due to cost constraints. This has enabled small-scale enterprises in Nigeria to compete effectively with larger corporations, thereby levelling the playing field in the market.

The introduction of GSM technology has also promoted entrepreneurship among Nigerian youths, particularly in the informal sector. By providing access to information, networking opportunities, and business tools, GSM has lowered the barriers to entry for aspiring entrepreneurs [9]. This development is particularly important in a country grappling with high unemployment rates, as it provides an avenue for economic empowerment and self-reliance. The ripple effect of this entrepreneurial growth on the broader economy further underscores the importance of GSM technology in small-scale enterprise development.

However, the reliance on GSM technology has raised concerns regarding its sustainability and environmental impact. The increasing use of mobile devices has contributed to e-waste generation, while the energy requirements of telecommunication infrastructure have raised questions about carbon emissions [10]. Addressing these issues through sustainable practices and innovations is crucial to ensure that the benefits of GSM technology are not achieved at the expense of environmental degradation.

From a policy perspective, the Nigerian government has recognised the role of GSM technology in economic development and has implemented various initiatives to support its integration into small-scale enterprises. Establishing the National Digital Economy Policy and Strategy (2020–2030) underscores the government's commitment to leveraging digital technologies to drive economic growth [11]. These policies address digital literacy and affordability challenges, creating a conducive environment for small-scale enterprises to thrive.

Despite the positive impact of GSM technology on small-scale enterprises, regional disparities in access and usage remain a concern. Businesses in rural areas often face greater challenges due to poor network coverage, higher costs, and limited access to GSM-enabled financial services [12]. Bridging this digital divide is essential to ensure that the benefits of GSM technology are inclusive and equitable.

Furthermore, the role of GSM technology in facilitating business continuity during crises cannot be overlooked. During the COVID-19 pandemic, small-scale enterprises leveraged mobile communication tools to adapt to disruptions, maintain customer relationships and explore alternative revenue streams [13]. This adaptability highlights the resilience enabled by GSM technology, particularly in the face of unforeseen challenges.

In conclusion, the impact of GSM technology on the development of small-scale enterprises in Nigeria is multifaceted, encompassing enhanced communication, financial inclusion, marketing, and entrepreneurship. However, realising the full potential of GSM technology requires addressing existing challenges and promoting sustainable practices. This study explores these dimensions in greater detail, providing insights into how GSM technology can be harnessed to foster the growth and sustainability of small-scale enterprises in Nigeria.

Literature review

Definition and Role of GSM Technology in Communication and Business. The Global System for Mobile Communication (GSM) is a digital telecommunication standard that facilitates voice calls, text messaging, and internet access, making it a cornerstone of global connectivity. According to [1], GSM technology has been transformative in bridging communication gaps, particularly in developing countries. In business, GSM enhances operational efficiency by enabling instant communication, reducing transaction costs, and supporting real-time decision-making [14]. For small-scale enterprises (SSEs), GSM has proven indispensable, allowing entrepreneurs to maintain relationships with customers, suppliers, and financial institutions, fostering business growth and market expansion [15].

Overview of Small-Scale Enterprises in Nigeria (Definitions, Characteristics, and Roles). Nigeria's small-scale enterprises (SSEs) are defined as businesses with fewer employees and limited capital investment, typically less than ₦5 million [16]. They are characterised by their localised operations, high adaptability, and significant contributions to the informal economy [17]. SSEs are the backbone of the Nigerian economy, accounting for over 48% of GDP and providing employment for a substantial portion of the population [18]. These enterprises play a vital role in poverty alleviation, innovation, and grassroots development, making them central to economic policy discussions in the country [2].

Connection Between Mobile Technology and Entrepreneurship. Mobile technology, particularly GSM, has emerged as a critical enabler of entrepreneurship in Nigeria and beyond. Research

[19] emphasises the role of mobile phones in reducing information asymmetry, facilitating market access, and improving business efficiency. Entrepreneurs leverage GSM for real-time communication, mobile banking, and digital marketing to maintain a competitive advantage [1]. Moreover, the widespread availability of GSM has democratised access to entrepreneurial resources, enabling small business owners in rural and urban areas to connect with suppliers, customers, and investors [15]. The intersection of mobile technology and entrepreneurship has been pivotal in driving innovation and economic growth, particularly in emerging markets like Nigeria.

Theoretical Framework: Technology Adoption. The Technology Adoption Model (TAM), developed [20], serves as a robust theoretical framework for understanding the acceptance and utilisation of GSM technology among small-scale enterprises (SSEs) in Nigeria. This model posits that two key factors – perceived usefulness and ease of use—significantly influence an individual's decision to adopt a new technology. In the context of GSM, perceived usefulness refers to the extent to which small business owners believe that mobile communication will enhance their operational efficiency and business outcomes. On the other hand, perceived ease of use relates to the simplicity and accessibility of GSM technology, which reduces the barriers to its adoption.

Authors [21] expanded on TAM by incorporating external variables such as social influence and facilitating conditions, which are highly relevant in the Nigerian context. For instance, the widespread use of GSM in urban and rural areas creates social pressure for entrepreneurs to adopt it as a business tool. Similarly, the availability of mobile infrastructure, such as affordable call rates and mobile banking services, serves as a facilitating condition that supports technology adoption [15].

Furthermore, Rogers' Diffusion of Innovation (DOI) theory complements TAM by emphasising the role of innovation attributes – relative advantage, compatibility, complexity, trialability, and observability—in influencing adoption rates [22]. Small business owners in Nigeria perceive GSM as offering a relative advantage over traditional communication methods, such as word-of-mouth or physical visits, by providing faster, cost-effective, and wider-reaching communication channels [1].

Integrating TAM and DOI theories provides a comprehensive lens to analyse how and why Nigerian SSEs adopt GSM technology. These frameworks explain the drivers of GSM adoption and offer insights into potential barriers, such as low digital literacy and inadequate network infrastructure. Addressing these challenges is essential for maximising the impact of GSM on the development of SSEs.

METHODOLOGY

The research employed a cross-sectional survey design to examine the study's objectives, focusing on owners of payphone centres and their employees as the population. The sample comprised youth and adults, both male and female, aged 15 to 75 years, including Nigerians and foreigners residing in Nigeria, with varying literacy levels. Data collection involved both primary and secondary sources. Primary data were obtained through questionnaires designed using a five-point Likert scale (strongly agree to disagree), while secondary data included literature reviews, online articles, newspapers, and lecture notes. The data collection schedule measured mobile communication tariffs, job opportunities, and cellphone benefits. The validity and reliability of the data collection instruments were established, and administration was conducted directly by the researcher and five assistants who were also owners of payphone businesses. Data were analysed using frequency distribution, percentages, and chi-square statistical tests to ensure clarity and comprehension. Finally, the findings were compiled and prepared using MS Office 2003 for presentation.

RESULTS AND DISCUSSION

Respondent Demographic Data are presented in Tables 1–13.

Table 1 - Distribution of Respondents by Gender

Gender	Frequency	%
Male	15	37.5
Female	25	62.5
Total	40	100

Table 2 - Distribution of respondents by age

Age	Frequency	%
15-30 years	18	45
31-46 years	12	30
47-62 years	8	20
63 and above	2	5
Total	40	100

Table 3 - Distribution of respondents by duration in the business

Duration	Frequency	%
Less than 1 year	2	5
1-3 years	7	17.5
4-6 years	19	47.5
7-9 years	12	30
Total	40	100

Table 4 - GSM has improved the standard of Nigerian small-scale entrepreneurs

Responses	Frequency	%
Agreed	10	25
Strongly agreed	22	55
Indifferent	1	2.5
Disagreed	2	5
Strongly disagreed	5	12.5
Total	40	100

Table 5 - GSM does not impact Nigerian small-scale entrepreneurs, only the Nigerian economy

Responses	Frequency	%
Agreed	2	5
Strongly agreed	-	-
Indifferent	3	7.5
Disagreed	9	22.5
Strongly disagreed	26	65
Total	40	100

Table 6 - All small-scale entrepreneurs in Nigeria have benefited from GSM services

Responses	Frequency	%
Agreed	15	37.5
Strongly agreed	5	12.5
Indifferent	9	22.5
Disagreed	10	25
Strongly disagreed	1	2.5
Total	40	100

Table 7 - The introduction of GSM in Nigeria has encouraged more entrepreneurs to embark on small-scale businesses (pay phone centres)

Responses	Frequency	%
Agreed	20	50
Strongly agreed	10	25
Indifferent	-	-
Disagreed	6	15
Strongly disagreed	4	10
Total	40	100

Table 8 - The introduction of GSM has increased the crime rate in Nigeria

Responses	Frequency	%
Agreed	18	45
Strongly agreed	7	17.5
Indifferent	1	2.5
Disagreed	4	10
Strongly disagreed	10	25
Total	40	100

Table 9 - GSM has helped Nigerian security officials combat crimes and fraud

Responses	Frequency	%
Agreed	10	25
Strongly agreed	23	57.5
Indifferent	-	-
Disagreed	7	17.5
Strongly disagreed	-	-
Total	40	100

Table 10 - GSM has helped to reduce the level of unemployment in Nigeria

Responses	Frequency	%
Agreed	6	15
Strongly agreed	29	72.5
Indifferent	1	2.5
Disagreed	3	7.5
Strongly disagreed	1	2.5
Total	40	100

Table 11 - GSM is to be used by medium and large-scale businesses and not for small-scale entrepreneurs

Responses	Frequency	%
Agreed	1	2.5
Strongly agreed	-	-
Indifferent	1	2.5
Disagreed	9	22.5
Strongly disagreed	29	75.5
Total	40	100

Table 12 - GSM is not useful to small-scale entrepreneurs because it is too expensive to maintain

Responses	Frequency	%
Agreed	3	7.5
Strongly agreed	5	12.5
Indifferent	2	5
Disagreed	7	17.5
Strongly disagreed	23	57.5
Total	40	100

Table 13 - The tariff for paying phone centres to make calls is cheaper than personal cell phones

Responses	Frequency	%
Agreed	9	22.5
Strongly agreed	21	52.5
Indifferent	1	2.5
Disagreed	6	15
Strongly disagreed	3	7.5
Total	40	100

Testing of Hypothesis 1

Ho: The introduction of GSM does not positively impact Nigerian small-scale entrepreneurs.

H1: The introduction of GSM positively impacts Nigerian small-scale entrepreneurs.

Table 14

Responses	O	E	o-e	2	2e
Agreed	15	8.0	7	49	6.125
Strongly agreed	5	8.0	-3	9	1.125
Indifferent	9	8.0	1	1	0.125
Disagreed	10	8.0	2	4	0.5
Strongly disagreed	1	8.0	-7	49	6.125
Total	40	40			14.0

Degree of freedom= (r-1)(k-1); (5-1)(2-1)=4. The level of significance used is 95%. Decision: Since the calculated value of X2 is greater than the critical or table value, the null hypothesis (Ho) is rejected while the alternative hypothesis (Hi) is accepted, concluding that the introduction of GSM positively impacts Nigerian small-scale entrepreneurs.

Test of Hypothesis 2

Ho: The introduction of GSM into Nigeria has not created job opportunities and has resulted in an increased crime rate.

H1: The introduction of GSM into Nigeria has created job opportunities and has resulted in the reduction of crimes.

Table 15

Responses	O	E	0-e		2e
Agreed	6	8.0	-2	4	0.5
Strongly agreed	29	8.0	21	441	55.125
Indifferent	1	8.0	-7	49	6.125
Disagreed	3	8.0	-5	25	3.125
Strongly disagreed	1	8.0	-7	49	6.125
Total	40	40			71.0

Degree of freedom=(r-1) (k-1); (5-1)(2-1)=4. The level of significance used is 95%. Decision: Since the calculated value of X2 is greater than the critical or table value, the null hypothesis (Ho) is rejected while the alternative hypothesis (Hi) is accepted, concluding that the introduction of GSM has reduced the crime rate.

Test of Hypothesis 3

H0: The high tariff on mobile communication will not affect the overall profitability of small-scale entrepreneurs and small-scale pay phone centres.

H1: The high mobile communication tariff will affect the profitability of small-scale entrepreneurs and small-scale pay phone centres.

Table 16

Responses	O	E	0-e		2e
Agreed	9	8.0	1	1	0.125
Strongly agreed	21	8.0	13	169	21.125
Indifferent	1	8.0	-7	49	6.125
Disagreed	6	8.0	-2	4	0.5
Strongly disagreed	3	8.0	-5	25	3.125
Total	40	40			31.0

Degree of Freedom=(r-1)(k-1); (5-1)(2-1)=4. The level of significance used is 95%. Decision: Since the calculated value of X2 is greater than the critical or table value, the null hypothesis (Ho) is rejected while the alternative hypothesis (Hi) is accepted, concluding that the high tariff of mobile communication will affect the overall profitability of small-scale entrepreneurs and the small-scale pay phone centre operators.

In this study, several key findings emerged from the analysis of the data collected:

1. The study revealed that GSM plays a significant role and is a vital prerequisite for developing small-scale enterprises in Nigeria.

2. GSM positively impacts small-scale entrepreneurs and the Nigerian economy, significantly developing the country's information and communication sectors.

3. The introduction of GSM technology has reduced crime rates by enabling individuals to quickly contact security agencies for timely responses.

4. The study highlights the need for the government to implement a unified tariff structure for all GSM operators in Nigeria. This is particularly important as the current high tariffs hinder profitability for payphone entrepreneurs and pose challenges to sustainable business operations.

CONCLUSIONS

The data analysis obtained from the sampled respondents demonstrates that GSM significantly impacts payphone entrepreneurs and the Nigerian economy. Questionnaires were administered to owners of forty payphone centres in Apapa To assess the role of GSM in developing small-scale enterprises. The responses were collated, tested for validity, reliability, and consistency, and analysed using percentages and chi-square statistical methods. Considering various relevant factors, the analysis reveals that GSM positively influences small-scale entrepreneurs' growth and development. Based on these findings, the following recommendations were proposed.

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