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Emerging Technologies Adoption and Performance of SMEs in Ogun State, Nigeria

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Abstract: *The study looked at how the performance of SMEs in Ogun State was affected by the use of emerging technologies, such as digital marketing, the Internet of Things, and service automation. The research was carried out in the Ogun State metropolis of Abeokuta using a survey research design. One hundred and seven supermarket owners answered a structured questionnaire. SPSS was used to analyze the acquired data. The results showed a correlation between SMEs' performance and emerging technology adoption. As a result, the alternative hypothesis is accepted and the null hypothesis is rejected. As a result, the study suggested that supermarket operators implement cutting-edge technologies to lower expenses and waste while also improving their dependability of correspondence in business. The results also suggested that the government encourage store operators to heavily utilize emerging technologies in their operations and provide support for the adoption of these technologies in the grocery industry. Therefore, the study recommended that supermarket owners should adopt emerging technologies to reduce cost and wastage and to also increase the reliability of business communication. The result also recommended that the government should give support to emerging technology adoption in the supermarket business and to also encourage supermarket owners to intensively use if emerging technologies in business.*

Keywords: Emerging- Technology Adoption, SMEs Performance, Service automation, Internet of Things, Digital marketing.

Introduction

Small scale is the backbone of any economy and the fastest-growing and most economically regulating sector globally, small and medium-sized enterprises (SMEs) are among the most profitable and competitive sectors when it comes to promoting economic growth and expansion. These successes can be attributed to the efforts made by individual business owners to make sure that the required technologies are implemented in order to meet the objectives of the enterprise. Small and medium-sized enterprises, also known as small and medium-sized firms, are companies with employee and revenue counts that are below predetermined thresholds. International entities like the World Bank, the European Union, the United Nations, and the World Trade Organization use the acronym "SME (Seyedeh, 2021).

SMEs have new difficulties as competitiveness in the global market grows (Chen *et al.,* 2016). Research already in the field shows that SMEs have certain obstacles while implementing and utilizing new technology (Abou-Shouk, 2013; Cerchione *et al.*, 2015). Despite the fact that researchers have focused more on the context of adopting new technologies in recent years, there are still gaps in the research. Emerging technologies can be applied in a variety of service industries, including smart healthcare (Hwang & Choi, 2019), marketing (Overgoor *et al.*, 2019), and finance (Hasan et al., 2020), according to research by Hwang and Choi (2019). Furthermore, Aly (2020) asserted that developing nations may gain from the quick advancements in technology and the digital transformation, which would boost labour productivity and create jobs.

Adoption of many technologies, including artificial intelligence, big data, cloud computing, cyber security, IoT, blockchain, smart technologies, and service automation, is meant to improve business performance among small and medium-sized enterprise (SME)

owners. However, SMEs in Abeokuta, Ogun State, particularly supermarket owners, are still hesitant to adopt emerging technologies because of a number of issues, including a lack of knowledge, expertise, resources, infrastructure, food safety, waste reduction, growing costs, and inventory management. These are a few of the main obstacles impeding the functioning of SMEs in the city of Abeokuta.

Consequently, supermarkets in Abeokuta, Ogun state, can use emerging technologies, such as digital marketing, automation of services, and the Internet of Things, to address these issues. In light of this, it is appropriate to talk about the performance of SMEs in Ogun State and the use of innovative technology. A few studies (Rachinger *et al.,* 2019; Kraus *et al.,* 2021; Ma *et al.,* 2021; Hafizullah & Fadil, 2023; Seyedeh, 2021); (Hussain *et al.,* 2023) have been done on the impact of adopting emerging technologies on the performance of SMEs, but to name a few, they were conducted both inside and outside of Nigeria, for example, in Sweden, Indonesia, Argentina, etc. Numerous scholars have examined different factors that influence SMEs' use of technology. For example, tactics, dimensions, factors, difficulties, crisis period, effects of technology on SMEs, etc., but it's necessary to look into how the performance of SMEs in Ogun State is affected by the adoption of emerging technologies like digital marketing, internet of things (IoT), and automation of services.

The study aims to examine the emerging technologies adoption and the performance of SMEs in Ogun State while the specific objectives are to, assess the effect of Automation of Service on SMEs' performance, examine the effect of the Internet of Things on SMEs' performance, and explore the effect of digital marketing on SMEs' performance

Literature Review

The Concept of SMEs

SMEs are businesses that have fewer than 250 employees and an annual revenue of less than 50 million euros. However, there is no one universally accepted definition of SMEs, and they can vary based on the country and industry. (Kadry & Ramasami, 2021). Depending on the nation, a company's size or classification as a SME is determined by a number of factors (CFI team, 2023). Another definition of SMEs is businesses that have fewer than 100 employees, while another is businesses that have fewer than 500 employees. A third definition is businesses that have less than $50 million in annual sales. As you can see, there are many different ways to define SMEs, but these are some of the most common (CFI team, 2023). In certain nations, the maximum number of workers is limited at 200. Among other things, a SME in the US is defined as one that employs no more than 500 people.

Service Automation

The idea of "service automation," which draws on a significant sociological and demographic trend, is to use automated technologies to achieve customer loyalty. Online product searching, evaluation, and purchase have been facilitated by the self-service generation for several years now (Middelburg, 2017). To create a single interface for all operations, service automation involves integrating all domain and functionality tools into different automation layers. It is the process of putting jobs, procedures, events, and corporate operations under automation. Knowledge bases and self-service portals are examples of customer service automation. Prepared responses, often known as standard email responses. Chatbots, virtual assistants, and live chat. The fundamental elements of service automation include devices, software, data, and infrastructure.

The Internet of Things

The term "Internet of Things" (IoT) is the network of devices that are connected to the Internet and can collect and exchange data. That is the basic definition, but to understand IoT fully, it's important to understand how these connected devices are used and how they interact with each other (Vermesan *et al.,* 2011). IoT refers to the network of physical objects, such as devices and appliances that are connected to the internet and can collect and exchange data. This includes things like smart homes, wearable devices, and smart cities. IoT allows for new applications, such as remote monitoring and control, and can improve efficiency and decision-making (such as RFID, radio frequency identification, wireless LAN, wide area networks, or other methods).

Digital Marketing

Digital marketing is the use of digital technologies, such as the internet, social media, and mobile devices, to reach and engage with customers and prospects. It involves the use of various digital channels to create, promote, and distribute content and offers that are relevant to the target audience. It also includes using data and analytics to understand the effectiveness of the marketing efforts and to optimize the results (Ramiro & Jesus, 2020). Digital marketing is the use of digital technologies, such as websites, email, social media, mobile devices, and search engines, to reach, engage, and influence target audiences. It involves using various digital channels to distribute content and offers that are relevant to the target audience, and to measure the impact of marketing activities (Ramasamy & Kadry, 2021).

SMEs Performance

The SMEs' performance has been inconsistent. For the most part, the subsector has filled the void in the production of goods and services. They have been

especially active in the production of replacement parts needed to keep the industries running smoothly and in the Agro-food processing sector. They have also aided in the creation of jobs, the utilization of local resources, the growth of manufactured and non-oil exports, and the advancement of entrepreneurial and technological skills in the area (Adebusuyi, 1997). Even though the subsector has received significant promotional initiatives, their execution has not lived up to the hype. As a result, the previously unpredictable political and economic climate causes the SMEs to still struggle with a number of issues. The process by which SMEs accomplish their goals is known as their performance.

Emerging Technologies and SMEs performance

The literature evaluation reveals a relationship between the performance of SMEs and their adoption of technology. SMEs are being hailed as revolutionaries because big businesses are reluctant to adopt creative solutions. The owner-manager's assessment of the availability of formal finance influences the purchase of new technology in addition to the company's technology policy (Hussain et al., 2023). Most significantly, perceptions vary from person to person and may be imagined or genuine, but they still have an impact on business decisions. Furthermore, research does not always show that innovative organizations outperform non-innovative firms in terms of performance (sales in the local and export markets), even though technology enables firms to be inventive and hence competitive (Edmund *et al.*, 2020).

Theoretical Review

The theoretical review explores the theoretical underpinnings of the growing use of technologies, as exemplified by IoT, digital marketing, and service automation, and their effects on the performance of small and medium-sized enterprises in Ogun State, Nigeria. The sub-variables provide promising approaches to solving the intricate problems with SMEs' performance in the Nigerian setting and are consistent with accepted theories.

Service Automation Using Service-Dominant Logic (SDL)

The term "service automation" describes the application of technology to automate and simplify several service delivery processes. In service-oriented sectors, it entails utilizing software, systems, and tools to improve customer happiness, efficiency, and accuracy. Service automation is supported by several ideas. One theory that contends that services are the essential building block of commerce and value creation in the contemporary economy is the Service-Dominant Logic (SDL), which was created by Stephen and Robert in 2004. SDL places a strong emphasis on the co-creation of value between clients and service providers. By doing away with manual labor, cutting down on errors, and improving service quality, service automation is essential to facilitating this value co-creation process.

Internet of Things Diffusion of Innovation (DOI) Theory

According to Gobakhloo and Tang (2013), the DOI was created by Rogers in 1983 and is regarded as the most important model for examining user intentions for the spread of new technologies. A sociological theory called the DOI is used to explain the steps involved in successfully embracing new technologies. Numerous industries, including marketing, social work, criminal justice, agriculture, public health, and communication, have successfully applied this idea (Hussain *et al.*, 2023). The Diffusion of Innovation Theory is applied in public health to hasten the adoption of significant projects that usually seek to alter the behaviour of the system.

Technology Organization and Environment (TOE) Digital Marketing

Tornatzky *et al.* (1990) developed this framework and it is used to understand how organizations adopt and use technology, and how they respond to changes in their environment. It considers three key factors: technology, organization, and environment. The technology factor refers to the availability and cost of technology, while the organization factor refers to the structure and resources of the organization. The environment factor refers to the external environment, such as the economy, regulations, and competition. (Hameed *et al.*, 2012; Kumar *et al.*, 2022). TOE framework is used to analyze how these three factors interact and influence each other. For example, the availability of new technology might influence the organization's resources, or the economic environment might influence the organization's structure. The framework can be used to predict the adoption of new technologies and to analyze the impact of new technologies on organizations (Tornatzky *et al.*, 1990).

Empirical Review

With the rapid advancement of information and communication technologies (ICTs) in the second part of the 20th century, the Third Industrial Revolution got underway. Production underwent significant changes with the introduction of the internet and the widespread use of digital computers. Economic academics' interest in the relationship between productivity and ICT has increased dramatically since the publication of the well-known Solow Paradox (Solow, 1987). As a result, ICT has been linked to the majority of earlier research on the relationship between productivity and technology adoption. While a small number of studies (Colombo *et al.*, 2013; Haller & Lyons, 2015) were unable to find any meaningful evidence on the relation, many studies

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(Greenan & Mairesse, 2000; Brynjolfsson & Hitt, 2003; Matteucci *et al.*, 2005; Hempell, 2005; Maliranta & Rouvinen, 2006) found that the adoption of ICT increases productivity. The adoption of technology could lower business productivity. According to Huggett and Ospina (2001), large equipment purchases result in a yearly decline in total factor productivity of 3–9%. Sakellaris (2004) discovered that the adjustment cost associated with implementing new technologies causes a significant decline in total factor productivity, which then begins to recover.

Methodology

The survey research design was employed in the study. In order to obtain primary data, 115 supermarket owners and managers in Abeokuta, Ogun State, Nigeria, were given questionnaires. The fact that Abeokuta City is one of Ogun State, Nigeria's most economically viable capitals played a role in the decision. The purpose of the pilot survey results, which included identifying the managers' comprehension of the phenomenon, the state of the activities created by each supermarket, the firm's dedication to these activities, and their relative impact on the performance of the enterprise's small and medium-sized enterprises (SMEs), was to ascertain the best questionnaire structure that would meet the specific study objectives. A four-point Likert scale was used in the questionnaire's design. 107 (93.04%) of the 115 questionnaires that were distributed with the assistance of research assistants were returned and determined to be valid and sufficient for analysis. SPSS was used to analyze the data.

Results and Discussion

Table 1: Reliability

Cronbach's Alpha	N of Items
.858	20

Source: Researchers' Computation from SPSS (2023)

The Cronbach alpha statistic in Table 1 was used to assess the consistency of the study's instrument. The dependability table's alpha score (0.858) indicates that the research instrument seems to be fairly reliable.

Table 2: Descriptive Statistics

	Mean	Std. Deviation	N
SME	17.1215	2.32586	107
AS	17.1589	1.74912	107
IoT	17.1776	1.94652	107
DM	17.4673	2.08461	107

Source: Researchers' Computation from SPSS (2023)

In Table 2, the mean scores of AS, IoT, DM, and SME are 17.1589, 17.1776, 17.4673, and 17.1215, respectively, while their standard deviations are 1.74912, 1.94652, 2.08461, and 2.32586. The series has no outliers, and each variable's standard deviation is modest, therefore the likelihood of obtaining an inaccurate conclusion is minimal.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.843[a]	.711	.703	1.26784

a. Predictors: (Constant), DM, AOS, IOT

Source: Researchers' Computation from SPSS (2023)

From the Table 3, R-squared statistic shows that the explanatory variables, Digital Marketing (DM), Automation of Service (AOS), and Internet of Things (IoT), account for approximately 84.3% of the variation in Small and Medium Enterprises (SMEs). Additionally, the corrected R square indicates that the explanatory factors may still account for 71.1% of the variation in Small and Medium Enterprises after adjusting for the degree of freedom.

Table 4: ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1.	Regression	407.857	3	135.952	84.579	.000[b]
	Residual	165.563	103	1.607		
	Total	573.421	106			

a. Dependent Variable: SME
b. Predictors: (Constant), DM, AOS, IOT

Source: Researchers' Computation from SPSS (2023)

The model's overall significance is shown in the F statistic Table 4; the probability value of 0.000 (F= 84.579), which is less than the significance level of 0.05, means that the null hypothesis will be rejected and verifies that the variables have a positive relationship.

Table 5: Estimated Coefficients

Model		Unstandardized Coefficients		Standard Coeffs Beta		
		B	Std. Error		T	Sig.
1.	(Constant)	-1.649	1.231		-1.340	.183
	AOS	1.285	.160	.966	8.037	.000
	IOT	-.690	.148	-.577	-4.658	.000

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	¤ DM	.491	.094	.440	5.243	.000

a. Dependent Variable: SME

Source: Researchers' Computation from SPSS (2023)

The p-value is less than 5%, as seen in the Table 5. This suggests that, on the whole, technological innovation and the performance of small and medium-sized enterprises are significantly correlated.

Table 6: Coefficient Correlations

		SME	AS	IoT	DM
Pearson Correlation	SME	1.000	.779	.620	.720
	AS	.779	1.000	.892	.745
	IoT	.620	.892	1.000	.763
	DM	.720	.745	.763	1.000
Sig. (1-tailed)	SME	.	.000	.000	.000
	AS	.000	.	.000	.000
	IoT	.000	.000	.	.000
	DM	.000	.000	.000	.
N	SME	107	107	107	107
	AS	107	107	107	107
	IoT	107	107	107	107
	DM	107	107	107	107

a. Dependent Variable: SME
Source: Researchers' Computation from SPSS (2023)

The correlation matrix in Table 6 displays the relationship between the variables. As the table illustrates, there is a substantial positive correlation between all of the parameters, technological adoption, and the success of SMEs. The correlations between SMEs and AS are 0.779, IoT and DM are 0.620 and 0.720, respectively.

Table 7: Total Variance Explained

	Initial Eigenvalues			Extr. Sum		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.810	34.052	34.052	6.810	34.052	34.052
2	5.220	26.098	60.150	5.220	26.098	60.150
3	4.043	20.216	80.366	4.043	20.216	80.366
4	1.773	8.866	89.232	1.773	8.866	89.232
5	1.188	5.942	95.174	1.188	5.942	95.174
6	.782	3.909	99.083			

Source: Researchers' Computation from SPSS (2023)

The Table 7 displays a cumulative total variance explained of 99%. This suggests that the research tool is fully loaded and capable of measuring the targets it is designed to measure.

Conclusion

The study comes to the conclusion that SMEs that adopt new technologies perform better because these SMEs are linked to the drivers that have been demonstrated to be important (digital marketing, internet of things, and service automation).

Regarding the first objective, the study establishes and finds that service automation affects SMEs' performance by enhancing employees' services to the clients. This investigation looks into the relationship between service automation and SMEs' performance. As a result, this will improve service innovation and customer experience.
The second objective, which looked at how the Internet of Things affected SMEs' performance, came to the same conclusion. The Internet of Things affects SMEs' performance because it will improve customer services, ease tension, and cut down on waste. Customers and other stakeholders will be able to connect to their services anywhere, at any time.

Regarding the third objective, which looked at how digital marketing affected SMEs' performance, the research found that one of the factors influencing SMEs' performance is digital marketing. For SMEs, integrating digital marketing into their operations would be a fantastic way to boost output. The study found that factors influencing the adoption of emerging technologies have an impact on SMEs' business performance. Therefore, encouraging SMEs to use cutting-edge technologies in their production is essential.

Recommendations

The following recommendations were given to supermarket owners and other SMEs in Ogun State based on the study's findings. Organizations should offer better customer service by implementing service automation. Using service automation is a smart move for supermarket owners who want to stay competitive and relevant in the market.

Adoption of the Internet of Things (IoT) might lower the cost of corporate correspondence, cut waste, and improve the dependability and speed of business communication. Supermarkets in Abeokuta can better access consumer and "supplier information by using digital marketing, which also opens up new avenues for business management and organization among (virtual/online or in-person) customers. Additionally, the government must to urge store operators to heavily utilize emerging technologies and assist their acceptance in the industry.

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