JOURNAL OF TECHNOLOGY MANAGEMENT AND BUSINESS
ISSN: 2289-7224 e-ISSN: 2600-7967

JTMB

Vol. 11 No. 2 (2024) 20-32
https://publisher.uthm.edu.my/ojs/index.php/jtmb

Impact of Product Innovation and Technological Innovation on Organisational Performance: Evidence from Nigerian Money Deposit Banks

Nafiu Badiru[1]*

[1] *Osun State University, NIGERIA*

*Corresponding Author: nafiu.badiru@pgc.uniosun.edu.ng
DOI: https://doi.org/10.30880/jtmb.2024.11.02.002

Article Info

Received: 19 August 2023
Accepted: 13 June 2024
Available online: 10 December 2024

Keywords

Competition, marketing, organisational performance, product innovation, technological innovation

Abstract

The performance of deposit money banks is critical to economic stability and growth, especially in a rapidly evolving financial sector. However, in recent years, many deposit money banks in Osun State have been grappling with challenges such as increased competition, regulatory changes, and shifts in customer preferences. These issues have pressured banks to explore innovative strategies to maintain and enhance performance. Therefore, the impact of product and technological innovation on organisational performance in Osun State deposit money banks was examined. The study population comprises 1356 staff of selected money deposit banks, of whom 331 were sampled. A survey research design approach was used, and questionnaires were used to gather the data analysed, with the use of descriptive and regression statistics method of data analysis. Findings revealed that product innovation significantly affected organisational performance (R^2 = 0.243 $p < 0.05$). Further, technological innovation significantly influenced organisational performance (R^2 = 0.434, $p < 0.05$). This study concluded that product and technological innovation significantly enhanced the organisational performance of money deposit banks in Osun State. Based on this conclusion, the study recommended that banks prioritise new product development and improve existing products. Also, banks should prioritise investments in technology and digital transformation to enhances their performance.

1. Introduction

Innovation has frequently been cited as the catalyst for growth, and it is worth noting that it can foster growth independently of the broader economic circumstances. Dabić (2019) defines innovation as organisations developing new products, enhancing existing ones, or improving services. Lee (2019) also underscores the significance of innovation in a company's performance, particularly in product-related aspects. Moreover, applying innovation is intrinsically linked to a market-oriented approach involving a series of steps to fulfil consumer needs. With heightened global competition, rapid technological progress, and shortened product life cycles, innovation has become an increasingly crucial attribute for achieving business excellence and maintaining a competitive edge. Research by Falahat (2020); Ferrucci (2020) reveals that organisations with a strong market orientation tend to achieve higher business performance than those with a weaker market orientation. Therefore, organisations that effectively implement market-oriented principles and generate value will likely achieve superior performance. The success of any perceptive organisation in today's era of deregulated economies and competitive markets largely hinges on its ability to outperform its rivals strategically (Onikoyi 2017).

However, the concept of product innovation entails the introduction of novel products or services or the substantial enhancement of existing ones (Polder et al., 2020). According to Guiné (2020), products embodying innovation have more potential for enhancing productivity and exhibit a direct correlation with business performance. Product innovation encompasses various facets. Firstly, from a customer standpoint, the product is novel. Secondly, from a company's perspective, the product represents a new addition to its offerings. Product modification refers to introducing variations to the firm's existing products (Atuahene-Gima 2019). The goal of product innovation is to attract new customers. Companies create new or adjust existing products based on customer needs (Adner & Levinthal, 2019). Shorter product life cycles lead companies to innovate (Duranton & Puga, 2021). Product innovation is vital for organisational success. Technological innovation, also crucial for success, is increasingly important in competitive environments (Akinde & Bako, 2020). Technology is now a critical intangible asset for survival and competition among companies. The trend is towards technological innovation, which profoundly influences industries and holds a crucial role in driving business expansion (Tran, 2014). Technology is a vital element that empowers companies to enhance their competitiveness, boost revenue, cut costs, and maximise profits (Quan & Nguyen, 2014).

Also, organisational performance revolves around how efficiently and effectively managers utilise the organisation's resources to achieve its objectives and satisfy stakeholders (Jones & George, 2019). Organisational performance is grounded in the notion that it encompasses a combination of valuable assets, including human, physical, and capital resources, all geared toward fulfilling a dream, vision, or shared purpose (Barney, 2020; Carton & Hofer, 2021). Numerous Nigerian companies face challenges competing against foreign counterparts due, in part, to their struggle with innovation (Akinde & Beko, 2020). While multinational corporations' benefit from incentives supporting overall business growth, local industries often need more essential elements like firm size, resources (financial and human), legal safeguards, efficient innovation in diversification, adaptability to market shifts, and technology adoption incentives. Innovation capability entails the expertise and knowledge required to adopt proficiently, Master, enhance existing technologies, and create new technologies (Guan & Ma, 2019). Evaluating organisational performance can involve various dimensions, such as marketing and strategic planning capabilities (Yan et al., 2019). This research work has valuable perspectives on the particular facets of innovation that play a role in achieving organisational achievements within the banking industry. It underscores the significance of product innovation for drawing in fresh clientele, boosting effectiveness, and adjusting to swiftly changing market requirements in the face of shorter product lifecycles.

Product innovation and technological advancement serve as potent and pivotal tools that strive to rescue and rejuvenate organisations. The pace of product and technological advancement has recently experienced a substantial surge, leading to shorter product lifecycles. This trend is anticipated to impact various sectors, notably the banking industry. The consequences of a stagnant, unchanging, and inert corporate environment should not be underestimated. The presence of outdated, long-standing, and fading product brands within an organisation's portfolio reflects its inadequate performance and potential. Nigerian banks encounter challenges in competing against both domestic and international rivals. Local enterprises need help to match their foreign counterparts' product quality and marketing prowess (Yan et al., 2019). This research aims to fuel growth by unveiling fresh market prospects for the banking sector. Given the growing technological adeptness of customers, many are inclined to manage their finances through desktop computers or mobile devices rather than visiting a nearby branch.

More so, this research is anticipated to hold significant value for scholars and professionals engaged in the finance domain. Additionally, previous investigations conducted in both developed and developing countries, such as Adeyeye (2020); Akinde and Bako (2020), Goudarz and Francesco (2016), Hong et al. (2023); Odumeru (2013); Prasetyo (2023); Peter (2023); and Priit and Maaja (2022), have examined the Impact of innovation on organisational performance. However, most of these studies were conducted outside the banking industry. Interestingly, they all addressed or deliberated upon the innovation-related factors that prompted this research to scrutinise the influence of product and technological innovation on the organisational performance of deposit money banks in Osun State, Nigeria. This study addresses this gap by conducting an extensive review of the effects of product and technological innovations on the organisational performance of deposit money banks in Nigeria. The research is structured into five main sections: introduction, literature review, methodology, results and discussion, and conclusion and recommendations.

In light of this, the study explores how product and technological innovation impact the organisational performance of selected deposit money banks in Osun State, Nigeria.

1.1 Objectives of the Study

1.1.1 Examine the Influence of Product Innovation on the Organisational Performance of Selected Deposit Money Banks in Osun State, Nigeria

1.1.2 Determine the Influence of Technological Innovation on the Organisational Performance of Selected Deposit Money Banks in Osun State, Nigeria

2. Literature Review

2.1 Conceptual Review

2.1.1 Innovation

Technical expertise and advancements are strategically employed within the innovation process, serving the interests of institutional agendas, whether business-oriented or government-driven, motivated by market principles or political doctrines. The term "innovation" typically encompasses three distinct categories: product innovation, process innovation, and technological innovation (Halila & Rundquist, 2020). Organisations innovate by adopting or creating solutions that diagnose, mitigate, or prevent environmental issues. In response to today's pressing environmental challenges, an amplified requirement and desire exists for innovative approaches. Innovation is defined as formulating and implementing ideas, operational methods, products, and protocols aimed at alleviating environmental burdens or attaining environmental sustainability objectives (Rennings et al., 2006).

In addition, further examination of the literature unveiled that there exist a minimum of eight distinct types of innovation: Innovation in processes and products, both incremental and radical changes, administrative alterations, technological shifts, as well as modifications in market dynamics and values (Seng et al., 2019). Joseph Schumpeter, a renowned economist from the 20th century, outlined five categories of innovation, which encompass: establishing a fresh source of raw materials or other inputs; introducing novel products or bringing about qualitative shifts in existing ones (product innovation); innovative changes in processes; opening up new markets (market innovation); and transformations in industrial organisation (OECD, 2005). Product innovation involves creating new products, modifying the design of established ones, or using novel materials/components in manufacturing existing items. From a consumer standpoint, it aims to provide added value by being the first in a specific product category. This boosts market success, including market share, sales revenues, growth, and profit achievement (Rochford & Linda, 2019; Calantone et al., 2020). Bustinza (2019) emphasises that organisations enhance and develop products for the fresh value. Successful novel products enhance a company's performance (Frank, 2019; Ogbeibu, 2020). Davila's (2020) study asserts that product innovation positively impacts organisational performance.

Furthermore, technology is vital in enhancing a company's competitiveness, boosting revenues, cutting costs, and maximising profits (Quan & Nguyen, 2014). The systematic utilisation of physical forces in creating goods and services defines technology. It encompasses the expertise, methods, machinery, techniques, and systems employed to manufacture items and improve services. Technology results from acquired knowledge and practical skills, driving effective execution (Khalil, 2000). Technological innovation acts as the driving force behind economic activity. Integrating new technologies to address societal needs, environmental concerns, and business growth prospects fuels economic advancement. To remain competitive, organisations must embrace technological innovation. Technological innovation and core competitiveness are interdependent (Prhanlad & Hamel, 1990). Research by Kim et al. (1992) and Shashi et al. (2019) investigates technological innovation in SME production, concluding that active technological innovation enhances firms' processes and products.

2.1.2 Organisational Performance

Organisational performance refers to the evaluation of defined benchmarks or criteria encompassing effectiveness, efficiency, and environmental responsibility, which include measures like productivity, cycle time, adherence to regulations, and waste reduction. The fundamental principle underlying the concept of organisational performance is its composition of valuable assets, including human, physical, and capital resources, all aimed at realising a shared vision, aspiration, or common objective (Barney, 2020; Carton & Hofer, 2021). Firm performance pertains to a company's capacity to achieve profit and growth, aligning with its strategic goals (Hult et al., 2020). It results from the interplay of strategies in response to competitive pressures that enable the firm to adapt to its external surroundings, ultimately merging competence and effectiveness (Miller, 2019). Enhanced financial performance for financial institutions hinges on three main factors: institution size, asset management practices, and operational efficiency (Fowler et al., 2019).

2.2 Theoretical Framework

This study is based on Rogers' (1995) innovation diffusion theory (IDT), which has been frequently cited in case analyses. This theory offers a framework for comprehending how individuals adopt innovations and the factors influencing their choices. While Rogers' theory is versatile across various contexts, it proves challenging to employ

as a procedural model for organisational change when implementing an innovation. Rogers' diffusion theory consists of four primary elements: the innovation itself, communication channels disseminating information about the innovation, the social system surrounding adopters and non-adopters, and the time individuals transition through the adoption process. Therefore, this study embraces this theory due to the interconnectedness of these components, which sheds light on why individuals opt to adopt an innovation.

2.3 Empirical Review

Hong et al. analysed the effect of technological progress on Vietnam's economic growth (2023). Data for this study was gathered from 2015 to 2018 for 8,960 firms. The data gathered for this study were measured using FEM, Pooled OLS, and REM. The study's outcome revealed no adequate evidence on the state at which technological innovation impacts the firm performance of SMEs. However, significant influences were found between technological innovation and the performance of medium and large firms.

Fidelai and Ogor (2022) investigated the influence of product innovation on organisational performance in Nigerian manufacturing firms. One hundred twenty-four companies were sampled for this study. The study's outcome revealed a significant relationship between product innovation and organisational performance in Nigerian manufacturing firms.

Lim et al. (2010) used statistical data that covered 18 firms to examine the impact of innovation on the performance of Singapore construction firms. Experts in the firm were interviewed. The study discovered that innovation is a non-feasible competitive strategy in construction firms because construction projects are usually awarded by bidding for the contract with the lowest cost. Further discovery in the study revealed that manipulating innovations that customers will be willing to pay for would reduce construction costs, which is how construction firms can develop their competitive advantage.

Terziovski (2019) reviewed innovation practices and their impacts on the performance of SMEs in Australians. The study investigated 600 firms in the Australian manufacturing sector; the study's outcome discovered that innovation is the key indicator of performance in SM=s strategy. The study findings' conclusion revealed that SMEs' performance tends to increase the extent to which they discovered that strategy and innovation culture are closely aligned throughout the innovation process.

Onikoyi (2017) examined the influence of product innovation performance of organisations in Nigeria. 340 Questionnaires were distributed to several\\ staff in various critical departments of the chosen firm. The departments include; sales, marketing research and development, and quality control. Outcomes from the study were analysed using regression and correlation analysis. The study found that product innovation has a more substantial influence on the organisation's performance, and this is an s a result of customer perception of product innovation as a unique and favourable tool for organisational performance. Raji (2014) studied the effect of product innovation on manufacturing firms' performance in Kaduna, Nigeria. Nigerian Bottling Company was used as the case study. Primary and secondary data were used for this study. Questionnaires were administered to 80 staff of the firm. The outcome of the study revealed that shortfall in sales and profit is responsible for product innovation due to competitors' market influence; that there is a need to increase the company's turnover and maximise profit; that consumers' satisfaction is improved; that shareholders fund should be maximised through an increase in the rate of turnover and profit.

3. Methodology

This research employed a descriptive survey design. The study encompassed a total of 2,285 existing staff members from Guaranty Trust Bank (1,356), First Bank (502), Wema Bank (165), and Union Bank (262) in Osun State, Nigeria (Field Survey, 2023). The chosen sample size for the study was 331 participants, determined using Krejcie & Morgon's (1970) tabular approach at a 95% confidence level. A total of 331 questionnaires were distributed to the respondents. The questionnaire used a 5-point Likert scale to capture essential responses for each query. Content validation was conducted on the research tool to ensure data validity. The collected data were analysed using descriptive statistics (frequency, percentage, and means) and regression analysis.

3.1 Model Specification

The conceptual framework of this study establishes product innovation and technological innovation as the independent variables and organizational performance as the dependent variable. The predictive equation used in this study is presented below. The variables for this study were operationalised thus:

Y = f(X)
Where
Dependent Variables (Y) = Organisational Performance (OP)
Y = f (y,)

y = Organisational Performance (OP)
Independent Variables (X)
X= (x_1, x_2)
x_1 = Product Innovation (PI)
y_2 = Technological Innovation (TI)
Functional relationship (fn.)
Y =f(X)
Y = f (x_1) ……. …..fn.1
y_1= f(x_2) ……..fn.2
The regression equation is given then as;
y= f(x_1)
OP = f (PI)
$y = \alpha 0 + \beta_1 x_1 + \mu_i$
$OP = \alpha 0 + \beta_1 PI + \mu_i$ ……..Eqn. 3.1
y= f(x_2)
OP = f (TI)
$y = \alpha 0 + \beta_2 x_2 + \mu_i$
$OP = \alpha 0 + \beta_2 TI + \mu_i$ ……. …….Eqn.3.2
Where α = the constant of the equation
β_1- β_4 = the coefficient of variables in the equations;
μ_i = the stochastic function that accounts for the errors that may arise in the equation

4. Result and Discussion

4.1 Interpretation of Result

Table 1 revealed the characteristics of the respondents. The table presents that 49.2% of the respondents are male and 50.8% are female, indicating a higher male response rate to the questionnaire. Moreover, a significant % of the respondents, 37.8%, fall within the 25-35 age range, with 46.8% below 25 years, whereas 15.4% fall within 36-45 years. Regarding educational qualifications, 26.0% of the respondents hold B.Sc./HND/B.Sc. Degrees, while 45.6% of the respondents are ND/NCE holders. 28.4% of the respondents are M.Sc. and M.A. degree holders. Regarding the length of service, 69.2% of the respondents have 0-10 years of experience, and 30.8% have 21-30 years of experience. 30.8% of the respondents were at the top management level, whereas 22.4% and 46,8% were from middle and lower-level management. Furthermore, 15.4% of the respondents come from the business development department, and 26.3% and 46.8% come from the banking operation and customer support departments. Whereas 11.5% of the respondents work in the audit and internal control departments.

Table 1 *Characteristics of the respondents*

Characteristics	Variables	Frequency	Percentage (%)
Gender of the Respondents	Male	163	49.2
	Female	168	50.8
	Total	**331**	**100.0**
Age of the Respondents	Below 25years	155	46.8
	25-35years	125	37.8
	36-45years	51	15.4
	Total	**331**	**100.0**
Educational Qualifications	ND/NCE	151	45.6
	HND/B.Sc./B.A.	86	26.0
	M.Sc./MA	94	28.4
	Total	**331**	**100.0**
Length of service	0-10yeas	229	69.2
	21-30years	102	30.8
	Total	**331**	**100.0**

Current Management Level	Top	102	30.8
	Middle	74	22.4
	Lower	155	46.8
	Total	**331**	**100.0**
Current Department	Business Development	51	15.4
	Banking Operations	87	26.3
	Customer Support	155	46.8
	Audit and Internal Control	38	11.5
	Total	**331**	**100.0**

Source: Field Survey (2023)

Table 2 illustrates that 89 (26.9%) respondents strongly agree that their bank focuses on understanding the needs, challenges, and pain points of our target audience to create a product Additionally, 87 (26.3%) respondents agree, while 99 (29.8%), 24 (7.3%) and 42 (9.7%) respondents remain uncertain, disagree and strongly disagree respectively. Furthermore, a significant number of 111 respondents (33.5%) strongly agree that their o bank stays up-to-date with technological advancements and industry trends. In comparison, 88 respondents (26.6%) agree, and 38 respondents (11.5%) need clarification, with 56 (16.9%) and 38(11.5%) disagree and strongly disagree respectively. Moreover, 163 respondents (49.2%) strongly agree that their Bank focuses on generating innovative ideas through brainstorming sessions and creative thinking techniques, 39 respondents (11.8%) agree, while 57 respondents (17.2%) are undecided, while 34 (10.3%), and 38 (11.5%) disagree and strongly disagree their Bank focuses on generating innovative ideas through brainstorming sessions and creative thinking techniques.

Table 2 *Summary of the research question responses on product innovation*

S/N	Questions (Product Innovation)		Frequency	Per cent
1.	Our bank focuses on understanding the needs, challenges, and pain points of our target audience to create a product that addresses real problems (User Needs and Pain Points)	Strongly Agree	89	26.9
		Agree	87	26.3
		Undecided	99	29.8
		Disagree	24	7.3
		Strongly Disagree	32	9.7
		Total	**331**	**100.0**
2.	Our bank stays up-to-date with technological advancements and industry trends that could potentially reshape your product or open up new possibilities (Technology and Trends)	Strongly Agree	111	33.5
		Agree	88	26.6
		Undecided	38	11.5
		Disagree	56	16.9
		Strongly Disagree	38	11.5
		Total	**331**	**100.0**
3.	Our Bank focuses on generating innovative ideas through brainstorming sessions and creative thinking techniques (Creative Ideation and Brainstorming)	Strongly Agree	163	49.2
		Agree	39	11.8
		Undecided	57	17.2
		Disagree	34	10.3
		Strongly Disagree	38	11.5
		Total	**331**	**100.0**

Source: Field Survey (2023)

In Table 3, it is evident that 107 respondents (32.3%) express a strong agreement that their banks focus on identifying and integrating emerging technologies. On the other hand, 66 respondents (19.9%) agree, 88 (26.6%) remain undecided, 32 respondents (9.7%), 38 (11.5%) disagree and strongly disagree with this notion. Furthermore, 87 respondents (26.3%) strongly agree that their bank involves using technology to streamline and automate existing processes. Additionally, 115 respondents (34.7%) agree, 47 respondents (14.2%) are uncertain, 36 respondents (10.9%) disagree, and 46 respondents (13.9%) strongly disagree with the statement. Additionally, 87 respondents (26.3%) strongly agree that their banks revolve around utilizing data collection, analysis, and interpretation to gain valuable insights for informed decision-making.

Meanwhile, 116 respondents (35.1%) agree, and 70 (21.1%) undecided, 23 respondents (6.9%) disagree, and 35 respondents (10.6%) strongly disagree concerning the statement.

Table 3 *Summary of the research question responses on technological innovation*

S/N	Questions (Technological Innovation)		Frequency	Per cent
1.	Our bank focuses on identifying and integrating emerging technologies that have the potential to revolutionize your industry or product (Emerging Technologies)	Strongly Agree	107	32.3
		Agree	66	19.9
		Undecided	88	26.6
		Disagree	32	9.7
		Strongly Disagree	38	11.5
		Total	**331**	**100.0**
2.	Our bank involves using technology to streamline and automate existing processes, leading to increased efficiency and reduced costs (Process Optimization and Automation)	Strongly Agree	87	26.3
		Agree	115	34.7
		Undecided	47	14.2
		Disagree	36	10.9
		Strongly Disagree	46	13.9
		Total	**331**	**100.0**
3.	Our Bank revolves around utilizing data collection, analysis, and interpretation to gain valuable insights for informed decision-making (Data Analytics and Insights)	Strongly Agree	87	26.3
		Agree	116	35.1
		Undecided	70	21.1
		Disagree	23	6.9
		Strongly Disagree	35	10.6
		Total	**331**	**100.0**

Source: Field Survey (2023)

5. Test of Hypotheses

Table 4 *Relationship between product innovation and the organisational performance*

Variables	Coefficient	Std. Error	Beta	t-statistics	Prob
C	0.041	0.157		0.263	0.793
User Needs and Pain Points	0.086	0.026	0160	3.299	0.001
Technology and Trends	0.711	0.76	0.467	9.370	0.000
Creative Ideation and Brainstorming	0.028	0.022	0.062	1.246	0.213
R-Square	0.243				
Adj. Square	0.236				
F-Statistics	34.996				
P <	0.05				

Author's computation (2023)

Table 4 reveals the findings and displays an R-Square of 0.243 and Adj. R-square of 0.236 reveals that 23.6%, of the variance in organisational performance is influenced by product innovation components among sampled deposit money banks in Osun State, Nigeria. Meanwhile, 74.6% of the variation is attributed to unspecified variables. The results also include an F-statistic of 34.996 and a p-value less than 0.05, indicating the model's fitness. The table provides coefficients, standardised coefficients (Beta), t-values, and p-values for each predictor. The User Needs and Pain Points component holds a coefficient of 0.086 and a p-value of .001, signifying a meaningful positive impact. Its standardised coefficient (Beta) is 0.160, indicating a relatively minor effect. The predictor with the most significant impact on performance is the Technology and Trends, with a coefficient of 0.711 and a p-value of .000, demonstrating a substantial positive influence. Its standardised coefficient (Beta) is 0.467, suggesting a moderate to significant effect. Creative Ideation and Brainstorming exhibit a coefficient of 0.028 and a p-value of .213, signifying its lack of substantial contribution to organisational performance.

Table 5 *Relationship between product innovation and the organisational performance*

Variables	Coefficient	Std. Error	Beta	t-statistics	Prob
C	0.888	0.155		5.742	0.793
Emerging Technologies	0.668	0.063	0.568	10.585	0.001
Process Optimization and Automation	0.397	0.77	0.370	5.132	0.000
Data Analytics and Insights	-0.439	0.062	-0.450	-7.091	0.000
R-Square	0.434				
Adj. Square	0.429				
F-Statistics	83.66				
P <	0.05				

Author's computation (2023)

Table 5 revealed an R-square value of 0.434 and Adj. R-square value of 0.429, indicating that 42.9% of the variance in organisational performance is influenced by technological innovation within the sampled deposit money banks in Osun State, Nigeria. Conversely, 57.1% of the variation is attributed to unspecified variables not included in the model. The outcome presents an F-statistic of 83.66 and a p-value of 0.000, providing insight into the model's fitness level. The coefficients (B), standardised coefficients (Beta), t-values, and p-values for each predictor variable are displayed in the Table The Constant term holds a coefficient of 0.888 and a p-value of .000 (almost 0), highlighting its statistical significance in influencing organisational performance. Emerging Technologies possess a coefficient of 0.668 and a p-value of .000, indicating a meaningful positive impact on organisational performance. Its standardised coefficient (Beta) is 0.568, suggesting a moderate to substantial effect. Process Optimization and Automation component exhibit a coefficient of 0.397 and a p-value of .000, implying a significant favourable influence on organisational performance.The standardised coefficient (Beta) amounts to 0.370, indicating a moderate contribution. The coefficient for the Data Analytics and Insights component is -0.439, and its p-value is .000, signifying a substantial negative influence on organisational performance. Its standardised coefficient (Beta) is -0.450, indicating a negative contribution.

5.1 Discussion of findings

The research investigated how product and technological advancements affect the performance of deposit money banks in Nigeria. The results showed that well-defined product innovation has a positive impact on organisational performance, as demonstrated by R-Square of 0.243 and Adj. R-square of 0.236 under p-values 0.05. This finding is in line with studies of Fidelia and Ogor (2022), Onikoyi (2017), and Raji (2014) that supported the idea that product innovation contributes to organisational performance. Similarly, Frank (2019) and Ogbeibu (2020) noted in their research that having innovative products can enhance a company's performance.

Moreover, the Impact of technological innovation, exemplified by components like emerging technologies, process optimization and automation, and data analytics and insights significantly affects the performance of chosen deposit money banks in Osun State. This is evident from the R-Square of 0.434 and Adj. R-square of 0.429 under p-values 0.05. These findings suggest that adopting new technologies can lead to enhanced organisational performance. This conclusion is reinforced by the studies of Hong et al. (2023), Lim et al. (2019), and Terziovski (2019), which also support the idea of a substantial relationship between technological innovation and organisational performance.

6. Conclusion and Recommendations

The study concluded that adopting product innovation to address user needs and pain points, staying up-to-date on technology and trend, and focusing on generating innovative ideas through brainstorming sessions and creative thinking techniques enhanced organisational performance. The study further concluded that technological innovation is the driving force behind performance. Emerging technologies, process optimization and automation, and data analytics and insights are components of technological innovation that influence performance. Consequently, this study recommends that banks take several actions. First, banks should facilitate periodic seminars aimed at convening essential stakeholders from various departments within the designated deposit money institutions. The primary objective of these workshops should be to focus on synchronizing product and technology innovation plans with broader organizational objectives. Second, banks should actively explore and participate in the broader technological ecosystem beyond their internal operations. This could involve forming partnerships with technology providers, research institutions, and startups working on cutting-edge technologies relevant to the banking industry. Finally, banks should develop a comprehensive innovation

metrics dashboard that tracks key performance indicators (KPIs) related to both product and technological innovation. This dashboard should include quantifiable measures such as the number of new product features developed, successful technology integrations, customer feedback scores, and time-to-market for innovations.

Acknowledgement

We appreciate the support of the staff of deposit money banks in Osun State, Nigeria for their willingness to fill out the questionnaire.

Conflict of Interest

The author reaffirms that there is no conflict of interest regarding the paper's publication, ensuring its impartiality and objectivity.

Author Contribution

The author confirms sole responsibility for the following: study conception and design, data collection, analysis and interpretation of results, and manuscript preparation.

References

Aboelmaged, M., Bani-Melhem, S., Al-Hawari, M. A., & Ali, I. (2024). Product innovation research over the past 60 years: a bibliometric analysis of intellectual structure and emergent trends. *Benchmarking: An International Journal*, *31*(6), 2034-2060.

Adeyeye, T. C. (2020). *The Impact of technological innovation on organisational performance*. Lagos, Mixon Publishers Ltd.

Adner, R. & Levinthal, D. (2001). Demand Heterogeneity and Technology Evolution Implications for Product and Process Innovation*. Management Science*, 47, 611-628.

Akbari, M., Khodayari, M., Khaleghi, A., Danesh, M., & Padash, H. (2021). Technological innovation research in the last six decades: a bibliometric analysis. *European Journal of Innovation Management*, *24*(5), 1806-1831.

Akinde, M.A., Bako, Y.A. (2020). Technological innovation and organisational performance. International Journal of Innovative Research in Education, Technology & Social Strategies. 7 (1), 156-166

Andersson, U., Dasí, Á., Mudambi, R., & Pedersen, T. (2016). Technology, innovation and knowledge: The importance of ideas and international connectivity. *Journal of World Business*, *51*(1), 153-162. https://doi.org/10.1016/j.jwb.2015.08.017

Atuahene-Gima, K. (2019). An exploratory analysis of the Impact of market orientation on new product performance, *Journal of product innovation and management*, 69 (4), 61-83

Aznar-Sánchez, J. A., Velasco-Muñoz, J. F., Belmonte-Ureña, L. J., & Manzano-Agugliaro, F. (2019). Innovation and technology for sustainable mining activity: A worldwide research assessment. *Journal of Cleaner Production*, *221*, 38-54. https://doi.org/10.1016/j.jclepro.2019.02.243

Barney, J.B. (2020). *Gaining and Sustaining Competitive Advantage. 2nd ed*. Upper Saddle River, New Jersey, Pearson Education

Bunduchi, R., Crişan-Mitra, C., Salanţă, I. I., & Crişan, E. L. (2022). Digital product innovation approaches in entrepreneurial firms–the role of entrepreneurs' cognitive frames. *Technological Forecasting and Social Change*, *175*, 121343.

Bustinza, O. (2019). Product–service innovation and performance: The role of collaborative partnerships and R&D intensity. R&D Management, 49(1), 33–45. https://doi.org/10.1111/radm.12269

Calabrese, A., Castaldi, C., Forte, G., & Levialdi, N. G. (2018). Sustainability-oriented service innovation: An emerging research field. *Journal of cleaner production*, *193*, 533-548. https://doi.org/10.1016/j.jclepro.2018.05.073

Calantone, R. J., Vickery, S. K., & Dröge, C. (1995). Business performance and strategic new product development activities: an empirical investigation. *Journal of Product Innovation Management: An International Publication of the Product Development & Management Association*, *12*(3), 214-223.

Carton, R. B., & Hofer, C. W. (2006). *Measuring organizational performance: Metrics for entrepreneurship and strategic management research*. Edward Elgar Publishing.

Castillo-Vergara, M., Quispe-Fuentes, I., & Poblete, J. (2021). Technological innovation in the food industry: A bibliometric analysis. *Engineering Economics*, *32*(3), 197-209.

Chen, Q., Wang, C. H., & Huang, S. Z. (2021). Effects of organizational innovation and technological innovation capabilities on firm performance: evidence from China's Pearl River Delta firms. In *Inside the Changing Business of China* (pp. 72-96). Routledge.

Christensen, C.M. (1997). The Innovator's Dilemma. Boston: Harvard Business School Press.

Correia, M. J., & Matos, F. (2021, September). The impact of artificial intelligence on innovation management: A literature review. In *European Conference on Innovation and Entrepreneurship* (pp. 222-XIV). Academic Conferences International Limited.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *psychometrika*, *16*(3), 297-334.

Dabić, M., Lažnjak, J., Smallbone, D., & Švarc, J. (2019). Intellectual capital, organisational climate, innovation culture, and SME performance: Evidence from Croatia. *Journal of Small Business and Enterprise Development*, *26*(4), 522-544.https://doi.org/10.1108/JSBED-04-2018-0117

Davila, T (2020). An empirical study on the drivers of management control systems design in new product development, *Accounting, Organisations and Society*, 25, 4-5, 383-409.https://doi.org/10.1016/S0361-3682(99)00034-3

Duranton, G.,& Puga, D. (2021). Nursery cities urban diversity, process innovation, and the life cycle of products. *The American Economic Review*, 91, 1454-1477.

Fadun, O. S., & Oye, D. (2020). Impacts of operational risk management on financial performance: a case of commercial banks in Nigeria. *International Journal of Finance & Banking Studies*, *9*(1), 22-35.

Falahat, M., Ramayah, T., Soto-Acosta, P., & Lee, Y. Y. (2020). SMEs internationalization: The role of product innovation, market intelligence, pricing and marketing communication capabilities as drivers of SMEs' international performance. *Technological forecasting and social change*, *152*, 119908. https://doi.org/10.1016/j.techfore.2020.119908

Ferrucci, P. (2020). It is in the numbers: How market orientation impacts journalists' use of news metrics. Journalism, 21(2), 244–261. https://doi.org/10.1177/1464884918807056

Fidelia, I. G. E. M. O. H. I. A., & Ogor, M. O. R. K. A. (2022). Product innovation and organizational performance: The manufacturing industry perspective. *International Journal of Economic Perspectives*, *16*(6), 21-36. https://ijeponline.org/index.php/journal/article/view/260

Fontin, J. R., & Lin, S. W. (2019). Comparison of banking innovation in low-income countries: A meta-frontier approach. *Journal of Business Research*, *97*, 198-207.https://doi.org/10.1016/j.jbusres.2018.12.017

Fowler, S.W., King, A., Marsh, S.J., &Victor, B. (2013). Approaches to measurement. *Journal of Cross-Cultural Psychology* August 1, (44), 874-899.

Frank, A. G., Mendes, G. H., Ayala, N. F., & Ghezzi, A. (2019). Servitization and Industry 4.0 convergence in the digital transformation of product firms: A business model innovation perspective. Technological Forecasting and Social Change, 141, 341-351. https://doi.org/10.1016/j.techfore.2019.01.014

Govindarajan, V., & Kopalle, P. K. (2006). Disruptiveness of innovations: measurement and an assessment of reliability and validity. *Strategic Management Journal*, *27*(2), 189-199.

Guan, J & Ma, N (2019), Innovative Capability and Export Performance of Chinese Firms, *Technovation Journal. 17-30*

Guiné, R. P., Florença, S. G., Barroca, M. J., & Anjos, O. (2020). The link between the consumer and the innovations in food product development. *Foods*, *9*(9), 1317. https://doi.org/10.3390/foods9091317

Hadi, P. (2023). Effect of product innovation on SME's performance: The moderating role of organizational learning and market orientation. *International Journal of Business Ecosystem & Strategy (2687-2293)*, *5*(2), 47-54. https://doi.org/10.36096/ijbes.v5i2.405

Haila, F., & Rundquist, J. (2011). The development and market success of eco-innovations. *European Journal of Innovation Management*, *14*(3), 278-302. https://doi.org/10.1108/14601061111148807

Do, H. N., Do, L. C., Tran, M. D., Dao, A. T. A., & Tran, T. T. D. (2023). The impact of technological innovation on the performance of Vietnamese firms. *Interdisciplinary Journal of Management Studies (Formerly known as Iranian Journal of Management Studies)*, *16*(1), 299-321. https://doi.org/10.22059/ijms.2022.328219.674681

Horn, G., & Tokarski, K. O. (2015). Disruptime! - Guidance Towards Radical and Disruptive Innovation. In *Unternehmensentwicklung: Strategien und Instrumente aus Forschung und Praxis* (pp. 7-24). Wiesbaden: Springer Fachmedien Wiesbaden.

Hult, G. T. M., Morgeson III, F. V., Sharma, U., & Fornell, C. (2022). Customer satisfaction and international business: A multidisciplinary review and avenues for research. *Journal of International Business Studies*, *53*(8), 1695-1733.

Hultink, E. J., & Robben, H. S. (1999). Launch strategy and new product performance: an empirical examination in the Netherlands. *Journal of Product Innovation Management: AN INTERNATIONAL PUBLICATION OF THE PRODUCT DEVELOPMENT & MANAGEMENT ASSOCIATION*, *16*(6), 545-556.

Jones*, G. R. &*George*, J. M.* (2019). *Understanding and managing organisational behaviour.* Upper Saddle River, N.J.: Pearson Prentice Hall.

Khan, S. J., Dhir, A., Parida, V., & Papa, A. (2021). Past, present, and future of green product innovation. *Business Strategy and the Environment*, *30*(8), 4081-4106. https://doi.org/10.1002/bse.2858

Kim, J.S., Ritzman, L.P., Benton, W.C., Snyder, D.L. (1992). Linking Product Planning and Process Design Decisions, *Decision Sciences*, 23, 44–60. https://doi.org/10.1111/j.1540-5915.1992.tb00376.x

Kok, R. A., & Biemans, W. G. (2009). Creating a market-oriented product innovation process: A contingency approach. *Technovation*, *29*(8), 517-526. https://doi.org/10.1016/j.technovation.2008.12.004

Krejcie, R. V. (1970). Determining sample size for research activities. *Educational Psychol Meas*.

Lee, C. C., Li, X., Yu, C. H., & Zhao, J. (2021). Does fintech innovation improve bank efficiency? Evidence from China's banking industry. *International Review of Economics & Finance*, *74*, 468-483. https://doi.org/10.1016/j.iref.2021.03.009

Lee, C. H., Chen, C. H., & Trappey, A. J. (2019). A structural service innovation approach for designing smart product service systems: Case study of smart beauty service. *Advanced Engineering Informatics*, *40*, 154-167.. https://doi.org/10.1016/j.aei.2019.04.006

Lim, J.N, Schultmann, F. & Ofori, G. (2010). Tailoring competitive advantage derived from the needs of construction Firms. *Journal of Construction Engineering & Management*. *136*(5) 568 –580. https://doi.org/10.1061/(ASCE)CO.1943-7862.0000151

Maier, D., Maftei, M., Maier, A., & Biţan, G. E. (2019). A review of product innovation management literature in the context of organization sustainable development. *Amfiteatru Economic*, *21*(13), 816-829. https://doi.org/10.24818/EA/2019/S13/816

Malacina, I., & Teplov, R. (2022). Supply chain innovation research: A bibliometric network analysis and literature review. *International Journal of Production Economics*, *251*, 108540. https://doi.org/10.1016/j.ijpe.2022.108540

Manders, B., de Vries, H. J., & Blind, K. (2016). ISO 9001 and product innovation: A literature review and research framework. *Technovation*, *48*, 41-55. https://doi.org/10.1016/j.technovation.2015.11.004

Miller, J. R., Van Hooren, B., Bishop, C., Buckley, J. D., Willy, R. W., & Fuller, J. T. (2019). A systematic review and meta-analysis of crossover studies comparing physiological, perceptual and performance measures between treadmill and overground running. *Sports Medicine*, *49*, 763-782. https://doi.org/10.1007/s40279-019-01087-9

Muchoki, E. (2013). *The effect of product innovation on the financial performance of mobile telephony firms in Kenya* (Doctoral dissertation, University of Nairobi).

Odumeru, J.A. (2013), Innovation and Performance. Kuwait Chapter of Arabian *Journal of Business and Management Review*, 2 (12), 18-22. OECD, Paris

OECD, Paris OECD, Oslo Manual (2005). *Proposed Guidelines for Collecting and Interpreting*

Ogbeibu, S., Emelifeonwu, J., Senadjki, A., Gaskin, J., & Kaivo-oja, J. (2020). Technological turbulence and greening of team creativity, product innovation, and human resource management: Implications for sustainability. *Journal of Cleaner Production*, *244*, 118703. https://doi.org/10.1016/j.jclepro.2019.118703

Onikoyi, I. A. (2017). Impact of product innovation on organizational performance (A Survey of Nestle Nigeria Plc). *Journal of Marketing and consumer Research*, *37*(1), 2422-8451.

Pertuz, V., & Pérez, A. (2021). Innovation management practices: review and guidance for future research in SMEs. *Management Review Quarterly*, *71*(1), 177-213.https://doi.org/10.1007/s11301-020-00183-9

Samuelsson, P. (2023). The effects of innovation types and customer participation on organizational performance in complex services. *European Journal of Marketing*, *57*(13), 27-55.

Polder, M., Van Leeuwen, G., Mohnen, P., & Raymond, W. (2010). Product, process and organizational innovation: drivers, complementarity and productivity effects.

Prhanlad, C.K. & Hand, G. (1990). The core competencies of Corporation Business Review.

Priit, V., & Maaja, V. (2022). *The relationship of technological and organisational innovation with firm performance: opening the black box of dynamic complementarities*. The project was submitted to the University of Tartu School of Economics and Business Administration.

Quan, M. N., & Nguyen, Q. N. (2014). Factors affecting the decision of the technological innovation in small and medium enterprises in Can Tho city. *Journal of Social Science and Humanities, 14* (2014), 49-53

Raji, A.A. (2014). *Impact of product innovation on the performance of manufacturing company (A case study of Nigerian bottling company PLC, Kaduna)*. A research project submitted to the Department of Business Administration, Faculty of Management Sciences, Usman Danfodiyo University, Sokoto State.

Rennings, K., Andreas, Z., Kathrine, A., & Esther, H. (2006). The Influence of Different Characteristics of the E.U. Environmental Management and Auditing Scheme on Technical Environmental Innovations and Economic Performance. *Ecological Economics*, 57 (1), 45-59. https://doi.org/10.1016/j.ecolecon.2005.03.013

Rochford, L., & Linda, S. (2019). Generating and screening new product ideas, *Industrial Marketing Management*, Vol. 20, No. 4, pp. 287-296

Rogers, E. M. (1995). Lessons for guidelines from the diffusion of innovations. *The Joint Commission journal on quality improvement*, *21*(7), 324-328.

Salam, S., Senin, A. A., Sheeraz, M. I. S., & Zainab, S. S. (2020). Innovation management: a bibliometric analysis. *Journal of Public Value and Administrative Insight*, *3*(4), 169-182.

Seng, L.K., Yusof, N. A & Abidin, N. Z (2019). Types of innovation implemented by Housing developers in Developing Countries. *International Journal of Academic Research*, (3), 614–618

Shashi, Centobelli, P., Cerchione, R., & Singh, R. (2019). The Impact of leanness and innovativeness on environmental and financial performance: Insights from Indian SMEs. *International Journal of Production Economics, 212*, 111-124.

Song, X. M., & Parry, M. E. (1999). Challenges of managing the development of breakthrough products in Japan. *Journal of Operations Management*, *17*(6), 665-688.

Spann-Merchant, S. (1998). A Proposed Model of the Influence of Communication on the Diffusion of Technological Innovations.

Sya'rani, R., Halim, C., Anripa, N., Mahardhani, A. J., & Hudijono, S. (2024). Innovation and Challenges in Technology Environment. *Journal of Technology Global*, *1*(02), 188-195.

Terziovski, M. (2019). Innovation practice and its performance implications in small and medium enterprises (SMEs) in the manufacturing sector: A resource-based view. *Strategic Management Journal, 31*(8), 892-902.

Thomond, P., Herzberg, T., & Lettice, F. (2003, September). Disruptive innovation: Removing the innovator's dilemma. In *British Academy of Management Annual Conference:'Knowledge into Practice*.

Tran, V. T. (2014). *Impact of technological innovation policies on the sustainability of SMEs: The case of Binh Phuoc* [unpublished Master's thesis]. Vietnam National University, Vietnam.

Xie, X., Huo, J., & Zou, H. (2019). Green process innovation, green product innovation, and corporate financial performance: A content analysis method. *Journal of business research*, *101*, 697-706.

Yam, R. C., Guan, J. C., Pun, K. F., & Tang, E. P. (2004). An audit of technological innovation capabilities in Chinese firms: some empirical findings in Beijing, China. *Research policy*, *33*(8), 1123-1140.