

OPERATION MANAGEMENT STRATEGIES AND ORGANISATIONAL PERFORMANCE IN MANUFACTURING COMPANIES IN LAGOS STATE, NIGERIA

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Abstract

Despite extensive research on operational management strategies in other contexts, there is a lack of empirical evidence on the specific effects of Total Quality Management on productivity and Process Improvement on process efficiency within the Nigerian manufacturing sector. Moreover, most existing studies have focused on industrial organisation perspectives, trends, and competitiveness. Hence, this study examined the effect of operational management strategies on sustainability of manufacturing companies in Lagos State, Nigeria. Survey research design was adopted, with a sample size of 398 employees drawn from selected manufacturing companies registered with the Manufacturers Association of Nigeria (MAN) operating in Lagos State. Primary data were collected using structured questionnaires. The instrument was validated through content, face, and construct validity, with reliability established using Cronbach's alpha (ranging from 0.740 to 0.792). Data were analysed using multiple regression analysis to test the hypothesis at 0.05

significance level. The multiple regression analysis revealed that the combined effect of operational management strategies on organisational performance was statistically significant ($F = 10.889$, $p < 0.05$; $R = 0.327$; Adjusted $R^2 = 0.097$). Specifically, total productive maintenance ($\beta = 0.316$, $t = 2.047$, $p < 0.05$) and process improvement ($\beta = 0.737$, $t = 5.210$, $p < 0.05$) had positive and significant effects on organisational performance. However, total quality management ($\beta = 0.018$, $t = 0.129$, $p > 0.05$) had a positive but insignificant effect, while lean manufacturing ($\beta = -0.016$, $t = -0.117$, $p > 0.05$) had a negative and insignificant effect. The model explained only 9.7% of the variance in organisational performance, indicating that other factors beyond the studied strategies account for 90.3% of performance variations. The study concluded that operational management strategies, particularly total productive maintenance and process improvement, significantly influence organisational performance in manufacturing companies in Lagos State. Hence, organisations should adopt continuous monitoring and evaluation mechanisms to sustain quality improvements. The findings contribute to the understanding of operational management strategies in the Nigerian manufacturing context and provide practical implications for management practice and policy development.

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Keywords: Operational Management Strategies, Organisational Performance, Lean Manufacturing, Total Quality Management, Total Productive Maintenance, Process Improvement, Manufacturing Companies, Lagos State, Nigeria.

1. Introduction

Sustainability could be seen as the bottom line of the organisation revealing if the organisation has achieved its corporate goals or otherwise. Also, the issue of performance is not generic to one sector or organisation since every organisational could be viewed from the lens of different outcomes. The manufacturing sector is not left out in this drive. The implementation of operation management strategies could be seen as one of the challenges that manufacturing organisation in Nigeria, especially in lean manufacturing, total quality management, total productive maintenance and process improvement in achieving their goals. Outcomes such as capacity utilisation, productivity, customers' satisfaction are issues the manufacturing companies seek to achieve in light of the ever-evolving the business organisations

Globally, the changing environment, has characterized the global economy today, creating more complexity and uncertainty. As a result, companies face severe competitive pressure to do things better, faster, and low-priced (Taouab & Issor,

2019). The need to cope with a growing number of challenges arising from achieving organisational goals as seen in their performance has become a concern. Companies often struggle to execute strategy because of the difficulty in creating change in an organisation, but they do not communicate thoroughly and effectively enough. If front line leaders do not understand their roles in strategy and execution, it is difficult to get employees to break out of traditional roles and habits. According to Cox (2020), some companies simply do not attract or retain the talent and resources necessary to keep up with competitors. High turnover from a negative culture or lack of success not only costs a business talent, but it also costs time and money to hire and retrain new workers. A firm's performance can also be inhibited by a lack of commitment to or ineffective marketing and communication (Qualityze, 2020). Nigeria is an emerging economy with a diverse range of industries, but the country has long been plagued by challenges related to sustainability. Some of the key issues that continue to affect the performance of organisations in Nigeria include capacity utilisation, cost reduction, productivity, and customer satisfaction (Akinleye & Dadebo, 2019). One of the major problems that organisations in Nigeria face is low-capacity utilisation. Despite having abundant natural resources and a large market potential, most Nigerian companies operate below their capacity, resulting in low levels of production and revenue (Akpoviroro & Owotutu, 2018). There are several factors contributing to this, including inadequate infrastructure, high cost of energy, limited access to finance, and a shortage of skilled labour (Albloushi et al., 2023). Many companies in Nigeria are also faced with limited demand for their products

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and services due to weak purchasing power and a high level of competition (Ali et al., 2021). To reduce costs, Nigerian companies can explore strategies such as supply chain optimization, where they seek to streamline the process of procuring goods and services (Alofi & Younes, 2019).

This can involve working with suppliers to negotiate lower prices and improve efficiency in the supply chain. Additionally, companies can adopt lean management principles, which involve eliminating waste and improving efficiency throughout the organisation (Al-Omari et al., 2020). Outsourcing non-core functions, such as IT or accounting, can also be a cost-effective strategy for companies in Nigeria (Aureliano et al., 2019). One of the key challenges to productivity in Nigeria is the lack of investment in research and development (Worimegbe, 2020). Companies in Nigeria often operate with outdated technology and machinery, which limits their ability to produce goods and services efficiently (Ayange et al., 2021). A lack of skilled labour also hinders productivity, with many Nigerian workers lacking the necessary technical skills to operate modern machinery and equipment (Baumers & Holweg, 2019). To address this, Nigerian companies need to focus on investing in research and development, and in training their workforce to improve their technical skills (Beerepoot et al., 2019). Process efficiency is critical for the success of any business, but many organisations in Nigeria struggle in this area (Budur & Poturak, 2021). Companies in Nigeria often have frequent power outages and inadequate access to high-speed internet can disrupt daily operations and hinder companies from implementing efficient technology solutions. Additionally, poor

transportation networks can lead to delays in the supply chain, impacting overall operational efficiency. (Buer et al., 2021).

Various scholars such as Pambreni, et al. (2019), Johnson and Pramod (2020), Gackowiec (2019) Singh et al. (2022), Mutaqiem and Soediantono (2022), De Loecker and Syverson, C. (2021), Dieppe et al. (2020), Chen et al. (2019), Xiang and Chin (2021) investigated the influence of Total productive maintenance on Cost reduction. However, the extent to which the total quality management influences productivity in the Nigerian manufacturing sector has not been studied. Most of these studies are focused on other areas, such as the industrial organisation perspective, Trends, Drivers, Policies, total quality management, culture, productivity and competitiveness (Chen and Lin 2021, Goshime et al. 2019, Reiman et al. 2021, Attack et al. 2019). Therefore, the nonconformity in the connection between Total productive maintenance on Cost reduction creates an opportunity for further studies to fill the gap.

Studies on the Process improvement on process efficiency have been carried out in different research contexts (Kurdi et al. 2020; Ardani et al., 2019; Dam & Dam 2021; Rita et al., 2019; Khan et al., 2019; Kale 2019). However, the effect of process improvement on process efficiency is yet to be explored and its relationship with the sector according to the result observed by different studies (Shokouhyar et al. 2020; Flug et al. 2022; Chen & Chou 2020; Heo & Park 2021). Therefore, studies on the effect process improvement on process efficiency of sustainability of any firm, are encouraged to fill the observed gaps in results and findings. The manufacturing industry is a highly

competitive sector that is constantly evolving, driven by advances in technology and changes in consumer preferences. In order to remain competitive and profitable, manufacturing companies must employ effective operation management strategies that promote efficiency, reduce costs, and improve productivity.

Objectives of the Study

- i. examine the effect of operational strategies on sustainability of manufacturing firms in Lagos State, Nigeria

Hypothesis

- ii. **H₀₁:** Operational strategies have no significant effects on sustainability of manufacturing firms in Lagos State, Nigeria

Literature Review

2.1.1 Sustainability

Dhar (2019) defined sustainability as the extent to which an organisation achieves its goals and objectives, including measures such as capacity utilisation, productivity, cost reduction, and process efficiency. Sustainability is a multidimensional construct that refers to the degree to which an organisation achieves its goals and objectives (Leitão et al., 2019). It is a critical aspect of organisational success as it determines the organisation's competitive advantage, sustainability, and survival (Alshurideh et al.,

2022). Sustainability is a complex and dynamic construct that can be measured using various performance indicators such as capacity utilisation, productivity, cost reduction, and process efficiency (Owolabi & Amole, 2019).

The advantages of sustainability are increasing profitability, improving service delivery or obtaining the best result in the important areas of organisational activities. Satisfaction is an important result of performance therefore, it reflects the level of performance of an entity (Akpoviroro & Owotutu, 2018). Therefore, to be successful, it must reflect the level of performance of an organisation. A well-designed sustainability program can benefit employees, supervisors, and organisations in many ways, by utilizing meticulous and systematic evaluations, providing feedback specifically tailored to improve employee performance, identifying the training requirements that need to be met by employees to develop and promoting them, and facilitating the development of individuals and organisations (Rostam, 2019).

The major obstacle that prevents a firm from using its resources to the maximum is its lack of vision. An ability to envision itself providing positive solutions to the customer is the best strength any organisation can have (Singh et al., 2021). If a management does not have the ability to look into the current business environment and is unable to identify the kind of opportunities that was created, then it creates barrier to growth (Mahmoudi & Parviziomran, 2020). The challenges and solutions have to be identified from the environment of the organisation. If a management is not able to recognize, define and offer creative solutions to the

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requirements of the market then it was counting the missed opportunities in the long run. Another major obstacle to growth in an organisation is the ability of the firm to cope with changes that occurs unpredictably fast (Akinleye & Dadepon 2019).

The characteristics of sustainability are measured in four dimensions of performance, the dimensions are capacity utilisation, productivity, cost reduction, and process efficiency. According to (Abbas & Kumari, 2021) these dimensions are factors that lead to an organisation getting better results than their competitors and also building long lasting relationship with their customers and are the suitable variables for measuring the performance of the manufacturing industry. With the use of operation management strategies business leaders will have forward thinking on ways to improve their innovation and productions with will lead them to becoming top performance in the manufacturing industry (Saffar & Obeidat, 2020). Sustainability is a critical aspect of organisational success or growth that is measured by organisations using various performance indicators to know their current standing or performance against other competitors. The following are sub-variables of the dependent variables sustainability (capacity utilisation, productivity, cost reduction, and process efficiency) are some of the factors that influence sustainability.

2.1.2 Operation Management Strategies

Operations management strategies are the methods and techniques used by organisations to optimize their operations and improve efficiency, productivity, and overall

performance. These strategies involve the design, planning, control, and improvement of the processes used to produce goods or services (Torlak et al., 2019). Operation management strategies refer to the systematic and strategic planning, organizing, controlling, and directing of production processes to achieve efficiency and effectiveness in manufacturing companies. According to (Sabbaghtorkan et al., 2020), operations management is concerned with transforming inputs into outputs through the use of resources such as personnel, materials, equipment, and technology. Effective operations management strategies can lead to increased productivity, reduced waste, improved quality, and increased customer satisfaction (Abideen et al., 2021).

The basic role of operation management in the firm is its transformation role in the process of converting inputs such as raw materials into finished goods and services (Glock et al., 2019). The transformation role of operation management makes this function very important part of the whole organisation. As a result, it is directly responsible for many decisions within the firm and activities that give rise to product design and delivery problems (Pacheco et al., 2019). The design and management of operations strongly influence how much material resources are consumed to manufacture proper goods or deliver a service to customer. This way organisation has to make sure that there is enough inventory to produce the quantities that need to be delivered to the customer, and ensuring that what organisation made is what our customers want (Saragih et al., 2020).

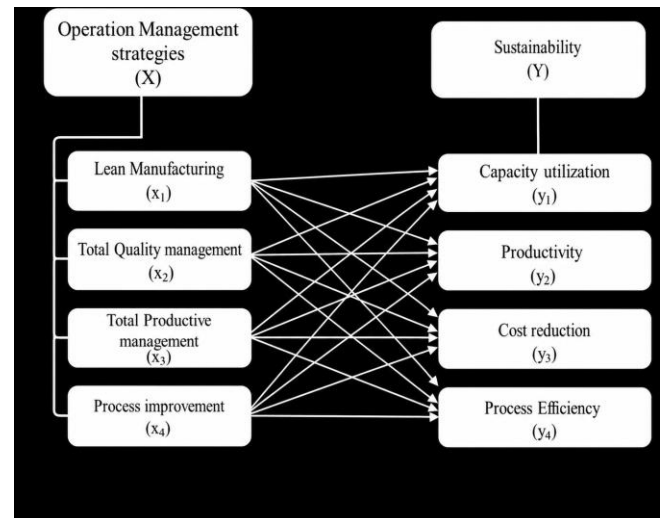
Several studies have highlighted the importance of operation management

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strategies for achieving organisational objectives such as efficiency, cost reduction, quality improvement, and customer satisfaction (Mahmoudi & Parviziomran, 2020). Operation management strategies are seen as a key means of achieving competitive advantage, particularly in the manufacturing sector where operational efficiency can significantly impact profitability, effective implementation of operation management strategies can lead to significant improvements in operational efficiency, quality, customer satisfaction, and profitability (Pacheco et al., 2019).

Implementing operation management strategies can be challenging, particularly in complex organisations with multiple stakeholders and competing priorities (Torlak et al., 2019). Some of the common challenges include resistance to change, lack of resources and expertise, communication and coordination issues, and cultural barriers (Sabbaghtorkan et al., 2020). Effective implementation requires careful planning, leadership commitment, employee engagement, and ongoing monitoring and evaluation. The following are the sub variables of operation management strategies (lean manufacturing, total quality management, total productive maintenance, and process improvement). These variables were chosen by the researcher as they are strategies that are used to by organisations effective, efficient and be productive without been wasteful or unproductive.

Conceptual Framework



Conceptual

Model

Source: Researcher, 2025

2.3. Total Quality Management (TQM) Theory:

Total Quality Management (TQM) is a management approach aimed at continuously improving the quality of products and services offered by organisations. It is an approach that emphasizes the need to involve all employees in the organisation to focus on improving quality and creating customer satisfaction (Dale e al., 2001). TQM is based on the premise that quality is not just the responsibility of the quality department but the responsibility of all employees in the organisation. One of the key principles of TQM is customer focus. This principle emphasizes the need to identify and meet the needs of customers (Waldman, 1994). According to this principle, all activities in the organisation should be aimed at creating customer satisfaction. Another principle of TQM is continuous improvement. This principle emphasizes the need to continuously improve the processes and

systems in the organisation to ensure that quality is maintained (Wilkinson et al., 1998).

The TQM approach is grounded in several theoretical perspectives. One of these perspectives is the Deming's Theory of Profound Knowledge (Watson, 2018). According to this theory, a successful organisation is one that is managed based on four interrelated areas of knowledge: appreciation of a system, knowledge of variation, theory of knowledge, and psychology. Deming argued that organisations must be managed based on these areas of knowledge to ensure long-term success (Padro, 2009).

Supporters of TQM theory argue that it can help companies achieve improved quality and customer satisfaction, as well as increased efficiency and cost savings (Manz & Stewart, 1997). They argue that TQM can help companies to identify and eliminate waste, improve production processes, and establish a culture of continuous improvement. Additionally, TQM can help companies to develop better relationships with suppliers and customers, which can lead to better coordination and more effective supply chain management (Hackman & Wageman, 1995). Critics of TQM theory argue that it can be difficult to implement and may not always lead to improved quality or efficiency. They argue that TQM can be overly bureaucratic and may place too much emphasis on documentation and process adherence (Dahlgaard et al., 2018). Additionally, critics argue that TQM may not adequately account for external factors such as market dynamics or government regulations, which can play a significant role

in determining a firm's success (Watson, 2018).

Methodology

The study focused on manufacturing companies in Lagos. Hence, the study was conducted in Lagos. The justification for using Lagos is that it has emerged as a major hub for the headquarters of national and global companies and the complex business and professional services that support them (Adebanjo et al., 2019). With a population well over 16 million, Lagos is the seventh fastest growing city in the world, and the second largest city in Africa (Akinleye & Dadebo, 2019). This is the heart of the city, the centre of commerce, finance, administration, and education. The principal manufacturing industries in Lagos include electronics equipment production, automobile assembly, food and beverage processing, metalwork, and paint and soap production (Orji & Ojadi, 2021). It is therefore important to examine how manufacturing firms are thriving in an area dominated by service providers and facing competition from an economically dominant environment. The *manufacturing industries* in Nigeria is an economic sector that brings approximately 10% of total GDP (Gross Domestic Product) each year (Edomah, 2019).

The survey research design was adopted for the study. A survey research approach is a type of quantitative research design that involves collecting data from a sample of individuals or organisations using a structured survey instrument (Stracke, 2020). The survey instrument typically consists of a set of standardized questions that are administered to the participants in a

consistent manner (Mehrad & Zangeneh, 2019). In the context of this study on operation management strategies and sustainability, a survey research approach was an appropriate method for collecting data on the key variables of interest (Bauer et al., 2021; Tabron & Thomas, 2023; Oladipo et al., 2019; Taherdoost, 2022).

The population of this study were the staff of the selected manufacturing companies; they were identified from the website of the Manufacturers Association of Nigeria (MAN) and the Nigerian Stock Exchange operating in Lagos State, Nigeria, which was the domain for the study (MAN). The sample size was drawn from the 3764 employees of selected manufacturing companies in Lagos State, Nigeria. Furthermore, the sample size was determined by Taro Yamane table of sample size in determining the sample size for this study and an alpha of 5%, the sample size is given as 398. The study will make provision for 10% of the sample size for possible non-response, incorrectly filled and unreturned questionnaires (WHO, 2015). The 10% of the sample size is 36, which means $362+36 = 398$. For the purpose of this study, primary data was used as they guarantee anonymity, permitted the use of standardized questions, and ensured uniform procedures in the data collection process (Taherdoost, 2022). The study will use structured, adopted questionnaires relevant to its objective.

The survey instrument was subjected to content and construct validity. The essence of this is to ensure that the research instrument measures what it was intended to measure (Clark & Watson, 2019). For construct validity of the research instrument, the data collected during the pilot study was used to carry out validation measures on the

questionnaire using exploratory factor analysis (Guillot et al., 2022). Construct Validity was established statistically using exploratory factor analysis (EFA) (FitzPatrick, 2019). Exploratory factor analysis, according to Graham et al. (2021), is a construct validity technique used in assessing the quality of a questionnaire.

Table 3.1 Result of Validity Analysis Test

Variables	Number of Items	KMO	Bartlett's Test	Sig.
Lean Manufacturing	5	0.778	41.359	0.000
Total Quality management	5	0.782	53.169	0.000
Total Productive Maintenance	5	0.797	54.154	0.000
Capacity Utilisation	5	0.497	27.186	0.002
Productivity	5	0.791	46.178	0.000
Cost Reduction	5	0.654	44.550	0.000

Table 3.5: Reliability of research instrument

Variables	Number of Items	Cronbach's Alpha	Composite reliability
Lean Manufacturing	5	0.751	0.763
Total Quality management	5	0.786	0.797
Total Productive Maintenance	5	0.792	0.802
Process Improvement	5	0.789	0.805
Capacity Utilisation	5	0.781	0.808
Productivity	5	0.776	0.788
Cost Reduction	5	0.740	0.753
Process Efficiency	5	0.758	0.776

Source: Field Survey Data (2026)

Subjecting the instrument to a reliability test increases transparency and decreases opportunities to insert researcher bias in qualitative research (Xu & Saleh, 2021). For this study, Cronbach alpha was used to test the reliability of the instrument (Wang & Blaabjerg, 2020).

Inferential statistics, such as correlation analysis and regression analysis, was used to test the hypotheses (Siedlecki, 2020). These tests will determine the strength and direction of the relationships between the independent variables (Lean manufacturing, Total quality management, Total productive maintenance, and Process improvement) and the dependent variables (capacity utilisation, productivity, cost reduction, and process efficiency).

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2b Result of Linearity Test

The assumption of linearity was measured using Pearson correlation coefficient as suggested by Cohen et al. (2003). The results are shown in Table 4.3.

Table 4.3 Pearson's Correlation Result

Independent Variables		Sustainability	Remarks
Lean Manufacturing	Pearson Correlation	.014	Linear
	Sig. (2-tailed)	.785	
	N	370	
Total Quality Management (TQM)	Pearson Correlation	.033	Linear
	Sig. (2-tailed)	.526	
	N	370	
Total Productive Maintenance (TPM)	Pearson Correlation	.200**	Linear
	Sig. (2-tailed)	.000	
	N	370	
Process Improvement	Pearson Correlation	.310**	Linear
	Sig. (2-tailed)	.000	
	N	370	

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Field Survey Data (2026)

Table 4.3 presents the results of Pearson's correlation coefficient analysis, examining the linear relationships among the variables in the study. The findings indicate that there are linear and statistically significant relationships between total quality management, total productive maintenance, process improvement, and sustainability. However, an exception is noted for the relationship between lean manufacturing and sustainability, where the coefficient was found to be statistically insignificant. The observed significance levels in the correlations for these variables signify the presence of linearity, suggesting that a linear relationship is evident among the variables. Furthermore, the relatively low correlation values across the variables imply that the model adheres to the linearity assumption of regression analysis. As a result, the assumption of linearity for the multivariate analysis is deemed fulfilled. These statistical insights provided a foundation for understanding the interplay of variables and contribute to the validity of the subsequent regression analysis.

4.5 Restatement of Research

H₀₁: The combined effects of operational management strategies have no significant effect on the Sustainability.

Multiple linear regression analysis was applied to test the hypothesis. The independent sub-variables are operation management strategies (lean manufacturing, total quality management, total productive maintenance, and process improvement), while the dependent variable was sustainability. In the analysis, data for operational management strategies were created by summing responses across all items under each strategy to generate

independent scores for each strategy. Data for sustainability was generated by adding together responses of all items under the variable to create index of sustainability, the results of the analysis and parameter estimates obtained are presented in Table 4

Table 4: Summary of multiple regression analysis for the effect of operational management strategies on sustainability

N	Model	B	T	Sig.	ANOVA (Sig.)	R	Adjusted R ²	F (4,365)
	(Constant)	63.402	12.231	.000				
	Lean	-.016	-.117	.907				
	Manufacturing							
	Total Quality	.018	.129	.898	0.000 ^b	0.327 ^a	0.097	10.889
	Management							
	(TQM)							
	Total	.316	2.047	.041				
370	Productive							
	Maintenance							
	(TPM)							
	Process	.737	5.210	.000				
	Improvement							

Source: Researcher's Findings 2026

Interpretation

Table 4.15 shows the multiple regression analysis results for the effect of operational management strategies on the sustainability of manufacturing companies in Lagos, Nigeria. The results reveal that total productive maintenance ($\beta = 0.316$, $t = 2.047$, $p < 0.05$) and process improvement ($\beta = 0.737$, $t = 5.210$, $p < 0.05$) have positive and significant effect on sustainability of manufacturing companies in Lagos, Nigeria while total quality management ($\beta = 0.018$, $t = 0.129$, $p > 0.05$) has a positive but insignificant effect on sustainability of manufacturing companies in Lagos, Nigeria. In contrast, lean

manufacturing ($\beta = -0.016$, $t = -0.117$, $p > 0.05$) has a negative and insignificant effect on sustainability of manufacturing companies in Lagos, Nigeria. This implies that total productive maintenance and process improvement with the exception of total quality management and lean manufacturing are statistically significant determinants of sustainability of manufacturing companies in Lagos, Nigeria.

The multiple regression model with $R = 0.327$ and the adjusted $R^2 = 0.097$ was found. It can be observed from table 4.15 that there is a low and positive correlation of 0.327 between the operational management strategies and the sustainability. It is also seen that the adjusted R square is 0.097 which indicates that only 9.7 per cent of the variance in sustainability of manufacturing companies in Lagos, Nigeria has been explained by operational management strategies. This, therefore, means that other factors not included in this study explain 90.3% variations in the sustainability of manufacturing companies in Lagos, Nigeria. This suggests a limited predictive power of operational management strategies. Based on the multiple regression coefficient results, the following predictive and prescriptive multiple regression equations were established for statically significant variables.

$$OP = 63.402 - 0.016LM + 0.018TQM + 0.316TPM + 0.737PM \text{ ----- Eqn(v)}$$

(Predictive Model)

$$OP = 63.402 + 0.316TPM + 0.737PM \text{ -----}$$

Eqn(v) (Prescriptive Model)

Where:

OP = Operational sustainability

Worimegbe, T.M (2026). Operation management strategies and organisational performance in manufacturing companies in Lagos State, Nigeria. *Babcock Business and Marketing Review*, 5(1), 1-21.

LM = Lean Manufacturing

TQM = Total Quality Management

TPM = Total Productive Maintenance

PI = Process Improvement

The regression equations show that holding operational management strategies to a constant zero, sustainability of manufacturing companies in Lagos, Nigeria would be 63.402. This means that sustainability of manufacturing companies in Lagos, Nigeria was at a value 63.402 without the operational management strategies. The findings in the prescriptive model show that taking all other independent variables at zero, a unit increase in total quality management, total productive maintenance and process improvement will lead to a 0.018, 0.316, and 0.737 units increase in the sustainability of manufacturing companies in Lagos, Nigeria respectively. However, a unit increase in lean manufacturing will lead to a reduction in sustainability of manufacturing companies in Lagos, Nigeria by 0.016. This implies that manufacturing companies in Lagos, Nigeria should focus on operational management strategies, particularly in the areas of total productive maintenance and process improvement, to improve their performance. Also, the F-statistics ($df = 4, 365$) = 10.889 at $p = 0.000$ ($p < 0.05$) indicates that the overall model was statistically significant in predicting how the independent variables influence sustainability. Therefore, this model can be used for estimating purposes. In summary, the findings show that the process improvement positively influenced sustainability the most followed by total productive maintenance, TQM, and lean manufacturing. In other words, it can be

concluded that process improvement contributed more to the increase in sustainability than other strategies at the manufacturing companies in Lagos State while lean manufacturing and TQM were found to be statistically insignificant predictors of sustainability. Based on these findings and the conventional p-values of some operational management strategies, the null hypothesis (H_0) which states that the combined effects of operational management strategies have no significant effect on the sustainability was rejected.

Discussion of Findings

The presented findings in Table 4.16 provide insights into the combined effects of operational management strategies on sustainability. The positive and significant effect of TPM on sustainability aligns with previous research (Nakajima, 1988; Oshri et al., 2015). These studies emphasize the role of TPM in improving operational efficiency, reducing costs, and enhancing overall sustainability. The positive coefficient ($\beta = 0.316$) suggests that an increase in TPM is associated with an increase in sustainability. The study identifies process improvement as a positive and significant contributor to sustainability. This finding aligns with lean thinking principles advocated by scholars like Womack and Jones (2003) and Liker (2004), emphasizing the importance of continuous improvement in enhancing overall sustainability. The high positive coefficient ($\beta = 0.737$) indicates a strong association between process improvement and sustainability.

The positive but insignificant effect of TQM on sustainability contrasts with some literature that highlights the positive impact

of TQM practices (Anderson et al., 2017). The finding suggests that, in the context of manufacturing companies in Lagos, Nigeria, TQM alone may not be a significant determinant of sustainability.

The negative and insignificant effect of lean manufacturing on sustainability challenges conventional wisdom and literature that often emphasizes the positive impact of lean principles (Womack and Jones, 2003; Liker, 2004). This finding suggests that, in this specific context, lean manufacturing practices may not contribute significantly to sustainability. The adjusted R-square of 0.097 indicates a low explanatory power, with only 9.7% of the variance in sustainability explained by the operational management strategies considered. This aligns with the understanding that sustainability is influenced by multifaceted factors beyond the scope of the investigated strategies. The prescriptive and predictive models provide equations for estimating sustainability based on the statically significant variables. These equations offer practical insights for organizations in Lagos, Nigeria, suggesting a focus on total productive maintenance and process improvement for performance enhancement.

Therefore, organisations in Lagos, Nigeria, are advised to prioritize total productive maintenance and process improvement initiatives to improve their overall performance. Additionally, the study suggests that lean manufacturing alone may not be sufficient for enhancing sustainability in this context. Organizations should approach lean practices with caution and consider other complementary strategies.

The findings contribute to the understanding of operational management strategies in the

specific context of manufacturing companies in Lagos, Nigeria. While TPM and process improvement emerge as positive contributors, the study challenges the assumed significance of lean manufacturing and TQM, highlighting the nuanced nature of sustainability and the importance of considering multiple factors in strategic decision-making.

Conclusion

This study examined the effect of operational management strategies on sustainability in selected manufacturing companies in Lagos State, Nigeria. The findings revealed that some of the parameter estimates of operational management strategies on sustainability are significant while some are insignificant. However, the combine analysis of the effect of operational management strategies on sustainability showed a significant effect. The results amongst others highlighted the importance of operational management strategies on improving sustainability particularly in manufacturing companies, the role of total productive maintenance in cost reduction, and the impact of total quality management on improving productivity etc. In general, the study emphasizes the need for organizations to enhance their management strategies in other to ensure a quality sustainability. These findings contribute to the existing knowledge and provided practical recommendations for manufacturing companies and other industries to enhance their performance amidst every other challenges faced by the organization.

5.3 Implication of the Findings

The following implications apply to different stakeholders based on the study's outcome.

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5.3.1 Implication for Management

The findings of this study have significant implications for management in manufacturing companies and other industries with similar characteristics. The identified positive effect of total productive maintenance on cost reduction underscores the importance of operational management strategies in improving sustainability. While the result should worry every management department, it should be more of a wake-up call for operational managers, every organization wants, especially manufacturing companies to produce the best quality of her product at the best possible reduced cost, in that regards cost reduction and total productive maintenance are expected to maintain an opposition direction effect. Therefore, Management should prioritize its productive maintenance to ensure steady presence in the business.

The study's revelation regarding the impact of lean manufacturing on capacity utilization calls for enhanced operational management strategies, lean manufacturing as a systematic approach to identifying and eliminating waste in a manufacturing process in order to improve efficiency and reduce costs in turn will greatly influence the sustainability. To maintain such status quo the management will need to be intentional about the companies operational management strategies and as a result should focus on optimizing the flow of materials and minimizing the inventory.

5.4 Recommendations

Based on the findings of the study, the following recommendations are provided:

1. Food manufacturing companies should prioritize total productive maintenance strategies in their

production processes for this will ensure reduced cost of production which will in turn manifest to affordable cost of goods in the market, thereby contributing significantly to the standard of living in the society at large.

2. The relationship exhibited between total quality management is a wake-up call on the standard of the manufacturing companies operational management strategies, however, having expected that a quality management strategies will enhance the productivity of any company, the study recommends that manufacturing companies should invest more on their management personnel, for this will metamorphose into a feasible productivity, which was of great benefit to the companies and the society at large.
3. The study highlights the significant impact of operational management strategies on sustainability. Manufacturing companies should explore and implement innovative operational strategically models, where feasible, to enhance sustainability which will in turn embrace the customers' expectations. Embracing technology-enabled innovations and providing the necessary resources and support for management personnel can lead to improved service delivery outcomes.
4. Manufacturing companies should establish mechanisms to continuously monitor and evaluate total quality (or operational) management. Regular assessments, customer feedback

Worimegbe, T.M (2026). Operation management strategies and organisational performance in manufacturing companies in Lagos State, Nigeria. *Babcock Business and Marketing Review*, 5(1), 1-21.

systems, and performance metrics should be implemented to identify areas of improvement and address any gaps in expected performances. This proactive approach will help maintain and enhance service quality levels, even in changing situations.

By adopting Total Quality Management (TQM) theory which fosters understanding of management approach aimed at continuous improvement of the quality of products and services offered by organisations. The study emphasizes the need to involve all employees in the organisation to focus on improving quality and creating customer satisfaction. This theoretical lens provides insights into how organisations can effectively improve their quality of management to ensure greater performance.

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