EFFECT OF OPERATIONAL MANAGEMENT PRACTICES ON PERFORMANCE OF FOOD AND BEVERAGE COMPANIES IN KADUNA STATE.

Maimuna Ibrahim Barau
Department of Business Administration, Faculty of management sciences,
Kaduna state university
mibrahimbarau@gmail.com 08032201926

Prof. Maryam Abdu
Department of banking and finance, Faculty of management sciences
Kaduna state university
maryam.abdu@kasu.edu.ng 08033326439

Dr. Yusuf A. Hashim
Department of banking and finance, Faculty of management sciences
Kaduna state university
yusuf.hashim@kasu.edu.ng 08036603515

Aliyu Aminu Abbas
Department Of Business Administration Faculty of Management Sciences
Kaduna State University.
aaabbas45@gmail.com or aminu.abbas@kasu.edu.ng 08037479862

Abstract

This study investigates the impact of operational management practices on the organizational performance of food and beverage companies in Kaduna Metropolis. A sample of 482 respondents from the entire population of large-scale firms participated in the survey method used in the study. Partial Least Squares Structural Equation Modeling (PLS-SEM) approach version 4.0 was employed to examine the relationship between operational management dimensions planning and supervision and organizational performance. Findings reveal that operational management significantly influences organizational performance, with effective planning and supervision serving as crucial drivers of efficiency, productivity, and profitability. Specifically, planning enhances clarity of responsibilities, decision-making, and resource allocation, while supervision promotes motivation, cohesion, and alignment of tasks with strategic objectives. Results further highlight that 77.8% of the variance in performance is explained by operational management, underscoring its central role in achieving sustainable growth. The study concludes that operational excellence, supported by systematic planning and strong supervisory practices, is vital for enhancing competitiveness and long-term survival in Nigeria's dynamic food and beverage sector.

Keywords: Operational management; Organizational performance; Planning, Supervision and Kaduna State.

1.0 Introduction

In today's highly competitive and globalized business environment, organizational success transcends technical competence, product quality, and market presence. Modern organizations are increasingly evaluated based on their operational efficiency, ethical conduct, accountability, and ability to consistently deliver value to stakeholders. The shift from the traditional manufacturing-driven economy to an information- and service-oriented economy has intensified the importance of effective operational management practices as a driver of organizational performance (Prabhala, 2021; Boyer & Lewis, 2022). Consequently, firms that fail to optimize their operational systems often experience declining productivity, reduced profitability, and weakened competitive advantage.

Operational management practices refer to the systematic planning, organizing, supervising, and controlling of organizational processes to ensure the efficient transformation of inputs into outputs. These practices are particularly critical in labor-intensive industries where human capital, production processes, and inventory systems interact continuously. Empirical evidence suggests that organizations with structured operational planning, effective supervision, efficient product development processes, and robust inventory management systems tend to record superior performance outcomes, including higher productivity, cost efficiency, customer satisfaction, and market share (Muafi, 2019; Yusuf, 2023).

The food and beverage industry occupies a strategic position in Nigeria's economy due to its role in food security, employment generation, industrial growth, and contribution to Gross Domestic Product (GDP). According to the National Bureau of Statistics (NBS, 2023), the food and beverage manufacturing subsector remains one of the largest contributors to Nigeria's manufacturing output. However, despite its importance, the industry has continued to face significant operational challenges, including rising production costs, supply chain disruptions, inefficient inventory systems, weak production planning, and inconsistent product quality. These challenges have raised serious concerns about the overall performance and sustainability of food and beverage companies, particularly at the sub-national level such as Kaduna State.

Recent industry reports indicate that many food and beverage firms in Nigeria have experienced declining operational efficiency, fluctuating output levels, and reduced profitability due to weak operational management practices (Manufacturers Association of Nigeria [MAN], 2022). Inflationary pressures, energy costs, and logistics constraints have further compounded operational inefficiencies, resulting in lower employee productivity and declining firm

performance (NBS, 2024). In Kaduna State, where several small, medium, and large-scale food and beverage companies operate, these operational challenges are more pronounced due to infrastructural constraints, inconsistent power supply, and limited access to modern production technologies.

Performance, which is the dependent variable of this study, is commonly measured in terms of productivity, profitability, operational efficiency, market share, and customer satisfaction. Financial performance, in particular, reflects the extent to which a firm efficiently utilizes its primary resources to generate income, sustain operations, and achieve overall organizational success, while also creating the capacity to mobilize additional resources for future growth (Gobe, Bello, Mustapha, & Suleiman, 2020). In line with prior studies, financial performance is further conceptualised as the degree to which a firm attains financial efficiency, as reflected in expected returns on production and marketing investments as well as increases in sales volume (Micheels & Gow, 2011; Suleiman, Aliyu, & Bello, 2021).

The importance of firm performance has been widely acknowledged in the literature, given its role in enhancing competitiveness, improving shareholder returns, generating employment, and contributing to overall economic growth (Hameed, Kurfi, & Bello, 2020). However, in contexts characterised by financial literacy limitations, accounting standard discrepancies, and regulatory exemptions that constrain the disclosure of financial statements, obtaining objective measures of financial performance becomes challenging. Consequently, researchers often rely on subjective or indirect performance indicators (Jogaratnam et al., 1999; Suleiman et al., 2021). Evidence from recent studies further suggests that declining performance in the food and beverage industry is closely associated with weak operational planning, ineffective supervision, poor product development processes, and inefficient inventory management systems (Boyer & Lewis, 2022; Yusuf, 2023). For instance, inadequate production planning frequently results in raw material wastage, delays in order fulfilment, and increased operational costs, while weak supervisory mechanisms reduce employee commitment and overall productivity.

Operational management practices such as planning, supervision, product development, and inventory management are therefore central to reversing performance deterioration in the food and beverage industry. Effective operational planning provides a structured framework for aligning organizational resources with strategic objectives, thereby enhancing workflow efficiency and minimizing operational bottlenecks. Supervision ensures adherence to operational standards, motivates employees, and improves coordination across production units, leading to higher output and

reduced errors (Muafi, 2019). Similarly, efficient product development practices enable firms to respond to changing consumer preferences and market demands, while effective inventory management minimizes stock-outs, reduces holding costs, and enhances production continuity (Yusuf, 2023).

The importance of this study is underscored by the growing need for empirical, quantitative evidence on how operational management practices influence performance outcomes within Nigeria's food and beverage sector, particularly in Kaduna State. While existing studies have examined operations management in manufacturing firms, limited attention has been given to state-level analyses that capture the unique operational realities of food and beverage companies operating in semi-industrialized economies. This study therefore seeks to bridge this gap by quantitatively examining the effect of operational management practices on the performance of food and beverage companies in Kaduna State, using recent data and contemporary analytical techniques.

Despite the food and beverages firms in Nigeria utilizes the procedures or operations to take inputs and make yields that fulfil clients, inadequate market research leads to a lack of understanding of consumer preferences, resulting in the production of goods that may not meet market demands (Schroeder, 2018). Inefficient production planning has led to overproduction or stockouts, causing disruptions in the supply chain and impacting overall profitability. Poor planning in allocating resources, both human and capital, has led to inefficiencies and increased production costs (Efini, 2019).

Furthermore, the debate in the literature has been inconclusive, for example studies like Clark, (2019); Alymkulova and Seipulnik (2017) agreed that organizational operations have positive impact on employee's commitment and organizational performance. However, Rawlings, (2020); Abdelkarim, (2020) found no significance impact of operations procedures and interactional justice on task performance of the employee. This inconclusive result in the literature is enough pointer that problem still exists as to whether operations management is relevant to employee's performance or not. Hence, a study of this nature becomes relevant. Therefore, this study aims to examine if operational management practices would influence the organizational performance of food and beverage companies in Kaduna metropolis.

1.1: Research Questions

The following questions are formulated to attain the laid objectives.

i. What is the influence of planning on organizational performance of food and beverage companies in Kaduna metropolis?

ii. To what extent does supervision influence organizational performance of food and beverage firms in Kaduna metropolis?

1.2: Objective of the Study

The main objective of the study is to examine the effect of operational management on organizational performance of food and beverage companies in Kaduna metropolis. The specific objectives are to;

i. Examine the influence of planning on organizational performance of food and beverage companies in Kaduna metropolis.
ii. Examine the extent supervision organizational performance of food and beverage firms in Kaduna metropolis.

2.0 Literature Review

2.1 Conceptual Framework

This sub-section views the different literature of previous scholar in regards to the concept of operations management in the selected dimension which are planning and supervision. Also, the conceptual framework of performance is been operationalized.

2.1.1 Organizational Performance

Organizational performance refers to the assessment and measurement of how well an organization achieves its goals, objectives, and outcomes. Organizational performance refers to the ability of an organization to achieve its stated goals and objectives effectively and efficiently (Yusuf, 2023). Yusuf, (2023) define performance as the attained outcomes of actions with skills of employees who perform in some situation.

Organizational performance is the result produced by the efforts of the organization's people and resources. It includes financial measures, market share, customer satisfaction, and other indicators of success (Sadri, 2020). Performance is simply the result of patterns of action carried out to satisfy an objective according to some standards. This means employee performance is a behavior which consists of directly observable actions of an employee, and also mental actions or products such as answers or decisions, which result in organizational outcomes in the form of attainment of goals (Lanre, 2018).

2.1.2 Operation Management

According to James (2019) operations management is the management of that part of an organization that is responsible for producing goods and/or services. That is, the act of working together successfully means that everyone understands not only their own role, they also understand the roles of others. Operational management practices refer to every procedure or methodological solution which is carried out on the shop floor and which is meant to improve the efficiency of production and logistic processes (Harry, 2019). Operations

management is concerned with the design, management, and improvement of the systems that create the organisation's goods or services. The majority of most organisations' financial and human resources are invested in the activities involved in making products or delivering services.

Operations management is therefore critical to organisational success (Parker, 2021).

i). Planning

Planning is the fundamental management function, which involves deciding beforehand, what is to be done, when is it to be done, how it is to be done and who is going to do it. It is an intellectual process which lays down an organisation's objectives and develops various courses of action, by which the organisation can achieve those objectives. It chalks out exactly, how to attain a specific goal (James, 2019). Planning is nothing but thinking before the action takes place. It helps us to take a peep into the future and decide in advance the way to deal with the situations, which we are going to encounter in future. It involves logical thinking and rational decision making (Muafi, 2019).

Planning is a first and foremost managerial function provides the base for other functions of the management, i.e. organising, staffing, directing and controlling, as they are performed within the periphery of the plans made (Prabhala, 2021). It focuses on defining the goals of the organisation, identifying alternative courses of action and deciding the appropriate action plan, which is to be undertaken for reaching the goals. It is pervasive in the sense that it is present in all the segments and is required at all the levels of the organisation. Although the scope of planning varies at different levels and departments (Voss, 2021).

ii). Supervision

Supervision is direction, guidance and control of working force with a view to see that they are working according to plan and are keeping time schedule. Further, they are getting all possible help in accomplishing their assigned work. Supervisors are those having authority to exercise independent judgement in hiring, discharging, disciplining, rewarding and taking other actions of a similar nature with respect to employees. Supervision implies guiding and looking after the work of the subordinates so as to ensure that the work is being done according to the norms laid down for the purpose. In this way, the primary objective of a supervisor is to help in getting the production maximised both quality- and quantity-wise (Mehri & Hosseini, 2018).

Supervision is the process by which a supervisor helps the supervisee to adjust to his/her job, to develop team spirit and to assume even greater responsibility. Supervision is the act of 'guiding the workers to develop their self in the best possible manner. It involves motivating, guiding, inspecting, superintending, developing, coordinating and controlling

the subordinates. Supervision refers to the direct and immediate guidance and control of subordinates in the performance of their task (Revelle, 2019).

2.2: Empirical Review

Recent empirical studies have increasingly emphasized the role of operational management practices in enhancing organizational performance, particularly within manufacturing-oriented industries such as food and beverage firms. Contemporary research also highlights innovation as a critical moderating factor that strengthens or weakens the relationship between operational management practices and performance outcomes.

2.2.1: Planning and Performance

Operational planning has been widely recognized as a foundational element of performance improvement in manufacturing firms. Boyer and Lewis (2022) examined the relationship between strategic operational planning and firm performance among manufacturing companies and found that firms with structured planning systems recorded significantly higher productivity, cost efficiency, and delivery reliability. Their findings further revealed that organizations that integrated technological and process innovations into their planning frameworks achieved superior performance compared to firms relying on traditional planning methods. Similarly, Akinwale and George (2021), in a study of Nigerian manufacturing firms, established that effective operational planning positively influences organizational performance indicators such as output efficiency and profitability. The study further demonstrated that innovation capability measured through process automation and adoption of digital planning tools significantly moderated the relationship between planning and performance, suggesting that innovative firms derive greater performance benefits from operational planning.

In the food and beverage sector, Yusuf, Gunasekaran, and Adeleye (2023) investigated the impact of production planning on operational performance and found that firms with flexible and innovation-driven planning systems were better positioned to manage demand variability and supply chain disruptions. Their results indicated that innovation in planning processes enhances responsiveness, reduces waste, and improves overall firm performance. Inventory management has also been identified as a major determinant of performance in manufacturing firms. According to Eroglu and Hofer (2021), efficient inventory systems positively influence operational and financial performance. However, their study showed that the adoption of innovative inventory technologies such as automated tracking systems and data-driven forecasting tools significantly amplified performance outcomes.

In the Nigerian context, Abdullahi and Sadiq (2023) found that food and

beverage companies that adopted innovative inventory management practices experienced reduced stock-outs, minimized wastage, and improved production continuity. The moderating effect of innovation was evident, as firms using modern inventory technologies achieved better performance compared to those relying on manual systems.

2.2.2: Supervision and Performance

Effective supervision is another critical operational management practice influencing employee productivity and organizational outcomes. Muafi (2019), whose findings remain relevant in contemporary studies, emphasized that supervisory effectiveness enhances employee commitment and operational efficiency. Building on this, recent studies have introduced innovation as a factor that reshapes supervisory practices.

For instance, Lee and Kim (2021) examined supervisory practices in manufacturing firms across emerging economies and found that innovative supervisory approaches such as digital performance monitoring systems and participatory leadership positively moderated the relationship between supervision and organizational performance. Firms that adopted innovative supervision tools reported higher employee productivity, reduced operational errors, and improved performance outcomes.

In a related study, Okorie, Uzonwanne, and Ibrahim (2022) analyzed food and beverage companies in Nigeria and observed that supervisory effectiveness significantly influenced operational performance. The study further revealed that innovation, particularly in the use of real-time performance tracking technologies and continuous improvement systems, strengthened the impact of supervision on productivity and efficiency.

Product development remains a critical operational function, especially in the food and beverage industry where consumer preferences change rapidly. Adegbesan and Ricart (2020) found that firms with strong innovation-oriented product development processes achieved higher market performance and customer satisfaction. Their study demonstrated that innovation moderates the relationship between product development efficiency and firm performance by enabling faster product adaptation and quality improvement.

More recently, Yusuf and Salami (2024) examined food and beverage firms in West Africa and reported that innovation-driven product development significantly enhanced operational performance and competitive advantage. Firms that invested in innovative processing techniques and product design recorded higher sales growth and operational efficiency than less innovative counterparts.

2.3: Synthesis of the Empirical Review and Identified Gap

The reviewed studies collectively indicate that operational management practices specifically planning, supervision, product development, and inventory management have a significant positive effect on organizational performance. More importantly, recent literature (2020–2025) consistently demonstrates that innovation plays a moderating role by enhancing the effectiveness of these operational practices. Firms that integrate technological, process, and managerial innovations into their operations tend to achieve superior performance outcomes.

However, despite the growing body of literature, empirical studies that simultaneously examine the moderating role of innovation in the relationship between operational management practices and performance within food and beverage companies at the state level in Nigeria remain limited. This study therefore seeks to fill this gap by quantitatively analyzing how innovation moderates the effect of operational management practices on the performance of food and beverage companies in Kaduna State.

2.4: Theoretical Framework

The systems theory was published by Kuhn, (1974) and states that a system is characterized

this study is anchored on Systems Theory and Dynamic Capabilities Theory, which jointly explain how operational management practices influence organizational performance and how innovation moderates this relationship in food and beverage companies in Kaduna State.

2.4.1: Systems Theory

Systems Theory, originally advanced by von Bertalanffy and later applied to organizational studies by scholars such as Kuhn (1974), views organizations as open systems made up of interrelated and interdependent components that interact with one another and with the external environment. The theory posits that no component of an organization operates in isolation; rather, the performance of the entire system depends on the effective coordination and interaction of its subsystems.

In the context of this study, food and beverage companies are conceptualized as systems comprising interconnected operational units such as planning, supervision, product development, inventory management, and human resources. According to Systems Theory, inefficiency or failure in any of these operational components negatively affects overall organizational performance. Conversely, effective coordination among these operational management practices enhances productivity, efficiency, and competitiveness.

The theory further emphasizes the importance of open systems, where organizations continuously interact with their environment by receiving inputs, transforming them through operational processes, and releasing outputs, while

also receiving feedback. Innovation plays a crucial role in this interaction by enabling firms to adapt their operational systems to changing market demands, technological advancements, and competitive pressures. Thus, Systems Theory provides a strong theoretical foundation for understanding how operational management practices collectively influence performance in food and beverage companies.

2.4.2: Dynamic Capabilities Theory

Dynamic Capabilities Theory, as advanced by Teece (2014), explains how firms integrate, build, and reconfigure internal and external competencies to address rapidly changing environments. Unlike ordinary capabilities, which reflect routine operational efficiency, dynamic capabilities enable organizations to adapt, innovate, and sustain competitive advantage over time.

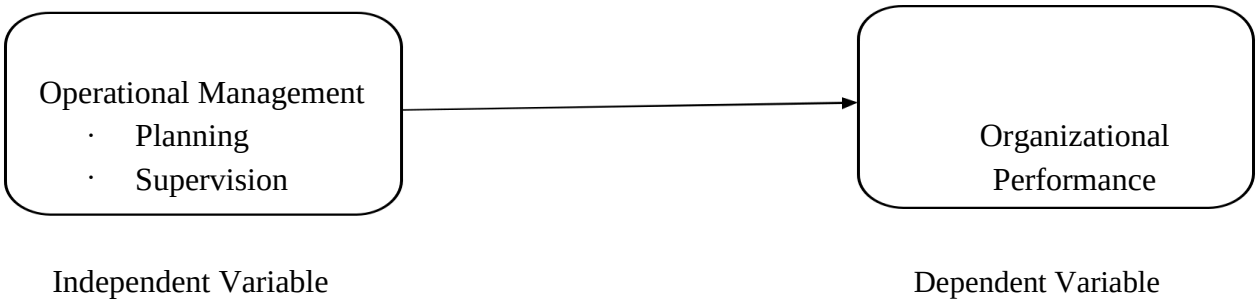
In this study, operational management practices such as planning, supervision, product development, and inventory management represent organizational capabilities that directly influence performance. However, Dynamic Capabilities Theory argues that the effectiveness of these practices depends on the firm's ability to innovate and reconfigure its operations in response to environmental changes. Innovation, therefore, acts as a higher-order capability that strengthens the impact of operational practices on performance.

For food and beverage companies operating in a highly competitive and volatile environment, innovation in production processes, supervisory methods, planning systems, and inventory technologies enhances responsiveness, efficiency, and market performance.

2.5: Relevance of the Theories to the Study

Systems Theory explains the **interdependence** between operational management practices and organizational performance, while Dynamic Capabilities Theory explains how innovation enhances and strengthens this relationship. Together, the theories provide a robust framework for analyzing how coordinated operational practices, supported by innovation, improve the performance of food and beverage companies in Kaduna State.

2.6: Conceptual Framework



3.0 Methodology

This section presents the procedure to be employed for the collection and analysis of data relevant to the investigation. The study adopts the survey and cross-sectional research design for this study. The research design enabled the researcher to make assessment of the performance of food and beverages as well as analyze their views and opinion on the impact of operation management. The population for this study was the total staff of the listed large-scale food and beverages firms in Kaduna metropolis. For the purpose of this research, permanent staff of the company were selected. The population of the study comprises of all the permanent staff as at 2nd March, 2025

Table 1: List large-scale Food and Beverage Companies in Kaduna State, Nigeria, Manufacturing Association of Nigeria.

S/N	Company Name	Sector	Location
1	Arla Foods Nigeria	Food (Dairy)	Kaduna
2	Niyya Farm Group Limited	Food (Juices & Yogurt)	Kaduna
3	Crown Flour Mill	Food (Grain Processing)	Tudun Wada, Kaduna
4	JJB Foods and Processing Limited	Food (Processing)	No. 5 Doka Street, Sabo, Kaduna
5	Nikoy Nigeria Limited	Food (Grain Processing)	KudendaIndustrial Estate, Kaduna
6	Mamia Seeds Oil Limited	Food (Vegetable Oils)	Katuru Road, Along Kaduna Airport
7	Nagari Seeds Nigeria Limited	Food (Seeds)	Sokoto Road, GRA, Zaria, Kaduna
8	Cool-me Beverages Limite	Beverage	Kaduna

	d		
9	Nigeri Deekwambos a Limite d	Food	B126 Kazaure Road, Sardauna Crescent, Kaduna
10	Oxen Foods	Food	Plot 2 Jemaa Road, FHE, Gonin-gora, Kaduna
11	Nigerian Breweries Plc, Kadun a	Beverage	Makera Road, Kaduna
12	North ern Noodles Limite d	Food (Noodles)	NNP Industr C ial Layout, No. 168 Kachia Road, Sabo, Kaduna
13	Pepsi Co (Seven-Up Bottling Co.)	Beverage	PepsiCo Complex, Kaduna
14	Zazzau Foods Ltd	Food	Rigas Layout a Industrial , Kadu na
15	Dangi Foods Limited	Food	No. 18 Abubakar Kigo Road, Kadu na
16	Arewa Bottling Company	Beverage	Arewa Industrial Area, Kaduna
17	Cway Food & Beverages Nigeria Co. Ltd.	Beverage	Kachia Road, Kaduna

Source: Manufacturing Association of Nigeria, 2024.

A sample is a part or subset of people, items, or events from a larger population that one collects and analyzes to make inferences. The sample size of the study was chosen based on the selection criteria. Companies that those not meet the criteria will be excepted from the study.

The following criteria are:

i. Those companies that are not operating within Kaduna metropolis.
ii. Those companies that have not being operational for over a decacde.
iii. Those companies that produces only grains, animal feeds, seeds and oil.

iv. And those companies that are only into processing and not production are excepted. Therefore, the sample population are

Table 2: Sample Size

S/N	Company Name	Sector	Number of Employees
1	Arla Foods Nigeria	Food (Dairy)	276
a2	Niyya Farm Group Limited	Food (Juices & Yogurt)	118
3	Cool-me Beverages Limited	Beverage	178
4	Deekwambos Nigeria Limited	Food	182
5	Oxen Foods	Food	78
6	Nigerian Breweries Plc, Kaduna	Beverage	300
7	Northern Noodles Limited	Food (Noodles)	146
8	PepsiCo (Seven-Up Bottling Co.)	Beverage	326
9	Zazzau Foods Ltd	Food	63
10	Dangi Foods Limited	Food	54
11	Arewa Bottling Company	Beverage	89
12	Cway Food & Beverages Nigeria Co. Ltd.	Beverage	258
TOTAL			2,662

The target population of the study are permanent staff of the selected large-scale food and beverages companies in Kaduna metropolis of Kaduna state. Therefore, the sample population of the study is estimated using Taro Yamane (19769) sampling formular. As a result of the inability of the researcher to effectively study the whole seller's strength population, a representative number was chosen as the sample size population. Three hundred and forty-eight (348) was used as the sample size. The sample size was calculated using the Taro Yamane scientific formula which is given as:

For the purpose of increased representation, 30% of the sample size as recommended by Israel (2013) was added bringing the total to 393 (302*30% = 348x0.3 = 384+104 = 452.4 or 452). This takes care of other unavoidable errors such as incorrect filling and failure of some respondents to return questionnaire. The copies of questionnaire were distributed personally to the participating respondents of the study using simple random sampling. However proportionate sampling was used to reach the total copies of questionnaires to be given to each selected manufacturing firm. Data were collected using a structured questionnaire administered to employees of selected food and beverage manufacturing companies in Kaduna State. All constructs were measured using

a five-point Likert scale, ranging from 1 = Strongly Disagree to 5 = Strongly Agree, which is suitable for PLS-SEM analysis. The use of previously validated instruments enhances the robustness and comparability of the findings.

Data collection is an important aspect of this study. The method for collecting data was primary data method of collection. For the purpose of this study, data was sourced from primary sources. The primary data consist of structured questionnaires designed to provide the necessary and accurate information for this research. These analyses were conducted using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach.

Planning (PL): Five (5) questions were adapted from the study of Eshiett, (2022)

Supervision (SV): Five (5) questions were adapted from the study of **Martin, (.2005)**

Organisational Performance (OP): Five (5) questions were adapted from the study of Spillan and Parnell, (2006)

4.0: Data Analysis and Presentation of Results

4.1: Missing Value Analysis

From the raw SPSS database, 7 randomly missing items were imputed for the observed indicators, OP1 (2) PL1 (4), PL3, SV1, and SV2. (Schafer, 1999; Tabachnick & Fidell, 2007) Scholars generally agree that a missing value rate of 5% or less is not significant. A collection of data's percentage of missing values that allow for trustworthy statistical inference is not set in stone, nevertheless. Additionally, experts advise that if the overall percentage of missing data is less than 5%, mean substitution is the simplest method to replace missing values (Tabachnick & Fidell, 2007).

Table 3: Missing Values by Variable

Constructs	Code	Missing	Percentage	Total Missing
	OP1	2	0.5	
	OP2	0	0	
	OP3	2	0.5	
Organisational	OP4	0	0	
Performance	OP5	0	0	
	PL1	4	1.0	5
	PL2	0	0	
	PL3	1	0.3	
	PL4	0	0	
Planning	PL5	0	0	
	SV1	1	0.3	2
	SV2	1	0.3	
	SV3	0	0	
	SV4	0	0	
Supervision	SV5	0	0	

Source: SPSS Output (2025)

4.2: Assessment of Outliers

The Mahalanobis distance (D2) method measures the distance of each observation in multidimensional space from the mean centre of all observations, producing a single result for each observation regardless of the number of variables included (Hair, Black, Babin & Anderson 2014). In this study, outliers were identified using the Mahalanobis distance (D2) at the 0.001 level of significance. Outliers were found in 15 cases (6, 29, 41, 62, 63, 77, 127, 137, 161, 194), which were subsequently removed, limiting the analysis to the 405 remaining data points.

4.3: Common Method Bias

In order to guarantee proper scale reliability, convergent validity, and to promote confidence in the study findings, precautionary procedural and statistical steps were taken to minimise potential method variance because the study data are reliant on self-reports. During data collection, the scale items from the survey were combined at random. The research also looked for common method variance in the data analysis. No one factor stood out, according to the findings of an exploratory factor analysis (EFA) that took into account all of the significant variables. Furthermore, the 'forced' single-factor solution only explained 36.4% of the variation, which is less than the suggested 50% criterion (Podsakoff et al., 2003). This indicates that CMV was not a significant issue in this study.

Table 4: Summary

Component	SS Loadings	% of Variance	Cumulative %
1	12.6	36.408	36.408

Source: SPSS Output (2025)

4.4: Correlation Matrix

Table 5 displays the Pearson correlation coefficient results for the study's variables.

Table 5: Correlation Matrix

Constructs	PL	SV	OP
PL	1		
SV	0.880	1	
OP	0.638	0.635	1

Source: SPSS Output (2025)

The degree of relationship between independent variables and the dependent variable is assessed using the correlation matrix. In order to determine the potential for multicolinearity among the explanatory factors, it is also utilised to determine whether a link exists between the independent variables themselves. Regressing versus performance separately would not have given us the full picture, thus this is required.

The relationship between the independent and dependent variables is displayed in the correlation matrix. The result of 0.880

indicates a comparatively positive association between the supervision (SV) and planning (PL). Furthermore, the result of 0. 638 indicates a comparatively positive association between organisational performance (OP) and planning (PL). A correlation coefficient of 0.635 indicates a relatively favourable relationship between organisational performance (OP) and supervision (SV). while a correlation coefficient of 0.689 indicates a relatively favourable relationship between organisational performance (OP).

4.5: Indicator Multicolliearity

Variables in an idea may be multicollinear, which is characterised by a strong correlation between them (Gaur & Gau, 2006). The Variance Inflation Factor (VIF) can be used to assess the indicators' multicollinearity (Fornell & Bookstein, 1982). To check for multicollinearity, this study also used VIF (Kothari & Garg, 2014). Kothari and Garg (2014) state that a VIF figure greater than 5 indicates significant multicollinearity. According to Table 4.3.5 II, each indicator's VIF value is below the allowed level. Thus, multicollinearity is no longer a problem in this study.

Table 6*:* Multicollinearity Statists (VIF) for indicators.

ITEMS	VIF
OP1	1.423
OP2	1.738
OP3	1.626
OP4	1.305
OP5	1.422
PL1	1.414
PL2	2.786
PL3	1.772
PL4	1.127
SV1	2.298
SV2	2.237
SV4	1.285

Table 7: Descriptive Statistics of Variables

Variables	Sample	Mean	Std. Deviation
PL	405	3.05	0.849
SV	405	2.62	0.810
OP	405	1.94	0.638

Source: Smart-PLS Output (2025)

4.6: Descriptive Statistics of Variables of the Study

The descriptive statistics for the study's variables are shown in Table 5.1. These include planning, supervision and organisational performance. A five-point Likert scale was used to measure each study variable. According to Table 4.4, the standard deviation for planning was 0.849 and the mean response was 3.05 respondents moderately agreed with comments regarding planning. Respondents agreed that their supervision is above average since they somewhat agreed with remarks about it (2.62 and 0. 0.810). Respondents agreed that their organisational performance is above average since they agreed with remarks about it as the mean show a score of 1.94and 0.638.

Table 8*:* Item Loadings, Internal Consistency, and Average Variance Extracted for First Order Construct

Constructs	Indi-cators	Load-ings	Cronbach's Alpha	Composite Reliability	AVE
Organisational Performance	OP1	0.788	0.780	0.849	0.532
	OP2	0.772			
	OP3	0.599			
	OP4	0.720			
	OP5	0.752			
Planning	PL1	0.854	0.755	0.847	0. 585
	PL2	0.809			
	PL3	0.598			
	PL4	0.773			
Supervision	SV1	0.869	0.776	0.870	0.694
	SV2	0.726			
	SV4	0.897			

Source: Smart-PLS Output (2025) AVE= Average Variance Extracted

All indicators have loadings greater than 0.60, as seen in Table 5.2, indicating item dependability when evaluating their corresponding reflective latent components.

4.7: Internal Consistency Reliability of Reflective Model

This discussion focusses on the extent to which different items or variables evaluate the same reflective latent concept (Sun et al., 2007; Bijttebier et al., 2000). Internal consistency is often assessed using the Cronbach's alpha coefficient (Cronbach, 1951; Cronbach & Shavelson, 2004). It offers a reliability evaluation based on the correlations between variables. Despite being widely used, the alpha coefficient has drawn criticism for underestimating the reliability of internal consistency and for being sensitive to the amount of variables

in a construct. As a result, the Composite Dependability (CR) criterion was proposed, which is particularly useful in SEM (Hair et al. 2014; Peterson & Kim 2013; Bacon, Sauer, & Young 1995).

Therefore, Cronbach's alpha and composite dependability have a range of 0 to 1, with bigger values denoting greater reliability. Composite reliability scores between 0.845 to 0.872 are considered acceptable and satisfactory (Hair et al., 2017). Values above 0.95, on the other hand, are undesirable since they indicate that all of the indicator variables are measuring the same thing, which casts doubt on their ability to accurately reflect the construct (Hair et al., 2017).

Table 4.5.2 above shows that organisational performance is associated with a CR of 0.849 and a Cronbach's alpha of 0.780, planning had a Cronbach's alpha of 0.755 and a CR of 0.847. Lastly, supervision had a Cronbach's alpha of 0.776 and a CR of 0.872. According to the previously stated maxim that CR values of 0.60 and above are acceptable, it has been determined that all of these constructs are reliable because their individual composite reliability values are all higher than the cut-off of 0.60 and fall below the problematic value of 0.95. Furthermore, it can be said that each construct's Cronbach's alpha is reliable because the results surpass the predefined cut-off requirement of 0.70. Consequently, it was concluded that all of the constructs were trustworthy after investigating Composite dependability and Cronbach's alpha.

4.9: Discriminant Validity

The Fornell-Larcker criterion is the first methodology used in this study. According to this approach, if a reflective construct's square root of AVE is higher than its correlation with any other reflective construct in the same model, it is said to have discriminant validity (Fornell & Larcker, 1981). This approach states that if a latent reflective construct's square root of AVE is greater than its correlations with other reflective latent constructs, it shares more variance with associated indicators than it does with any other latent construct in the model. This reflecting design differs from other structures as a result (Hair et al., 2014). According to this criterion, as indicated in table 4.5.5a, every reflective latent construct in this investigation has attained discriminant validity.

Table 9: Discriminant Validity (Fornell-Larcker Criterion)

Constructs	OP	PL	SV
OP	0.729		
PL	0.609	0.765	
SV	0.537	0.618	0.833

Source: Smart-PLS Output (2025)

Table 5.3a, each reflecting latent variable in this study exhibits discriminant validity, meaning that the square roots of its distinct AVEs are greater than the correlations with other variables. For a reflective latent variable to have discriminant validity when using the cross-loadings approach, its loadings for each of its indicators must be greater than their corresponding loadings (cross-loadings) on other constructs. Cross loading is often seen as a very forgiving criterion for demonstrating discriminant validity (Hair et al., 2011). Consequently, an assessment of the discriminant validity based on the cross-loadings criterion is given in Table 4.5.5b.

Table 10: Discriminant Validity (Heterotrait-Monotrait Ratio (HTMT)

Constructs	OP	PL	SV
OP			
PL	0.766		
SV	0.645	0.795	

Source: Smart-PLS Output (2025)

As can be seen in Table 5.3c, the HTMT statistics are presented using correlations between the items of the reflective constructs. Since the HTMT value is below the 0.85 threshold suggested by this study (Kline, 2011), all reflecting latent variables exhibit discriminant validity; only one relationship between goes beyond the hreshold that is OP and IV, but does not pose a problem for the model. To support the conclusion in the table, the HTMT confidence intervals are shown in table 4.5.5d below to further proved that HTMT is not an issue in this study.

Table 11: Heterotrait-Monotrait Ratio (HTMT) Confidence Intervals

Relationship	Mean	2.5%	97.5%
PL -> OP	0.609	0.542	0.671
SV -> OP	0.281	0.250	0.312

Source: Smart-PLS Output (2025)

Table 5.3d above displays the confidence interval for the HTMT finding along with the lower (2.5%) and upper (97.5%) confidence levels. Based on the upper confidence values, one may argue that discriminant validity has been established because none of the values are higher than the cut-off of 0.85. Stated otherwise, there

is a significant variation among all HTMT values about the HTMT inference criterion. Discriminant validity has been shown because there is a high association between all of the study's latent constructs and none of them are substantially different from one another. Therefore, the discriminant validity was checked using the Fornell-Larcker criterion, cross loadings, and the HTMT criterion. It is adequate to state that, when applied to all techniques, all of the study's latent reflective latent constructs exhibit discriminant validity.

4.10: Hypotheses Testing

The results of the structural model based on the causal relationships between the study's criteria variables and predictors are also displayed in Table 12 below. These results are interpreted using the t-value, standard error (SE), and coefficients (Beta) of the path connection. (T Statistical). At the 5% level, the hypothesis' significance was assessed.

Table 12: Hypotheses test for direct and moderating relationship

R/Ship	Beta Values	Std. Dev.	T Statistics	P Values	Decision
OM -> OP	0.692	0.016	37.590	0.000	Reject

Source: Smart-PLS Output (2025)

Operational Management (OM) has significant influence on Organisational Performance (OP) of food and beverage firms in Kaduna metropolis. It is seen on Table 12, that Operational Management is significantly related to Organisational Performance with (β = 0. 692, T- stat = 37.590, p < 0.000). Therefore, $H0^1$ Operational management has no significant influence on organizational performance of food and beverage firms in Kaduna metropolis is empirically rejected.

4.11: Coefficient of Determination: R-Squared

The coefficient of determination, or R-square level, was used to analyse the amount of variance that the external latent variables explained on the endogenous latent variables.

Table 13: Coefficient of Determination: R-Squared

Construct	R Square
OM	0.995
OP	0.778

Source: Smart-PLS Output (2025)

Table 13 shows that 77.8% (0.778) of the variation in operational management may be attributed to planning, and supervision, while, 99.5% (0.995) of the variation in organisational performance may be attributed to operational management. According to Chin's (1998) recommendation that R2 values of 0.67, 0.33, and 0.19 be assessed as substantial, moderate, and weak, respectively, the R2 value explained by these latent variables on the target endogenous latent variable is therefore substantial.

4.12: Assessment of the Effect Size: F-Squared

According to Hair, Ringle, and Sarstedt (2013), the effect size (f2) need to be assessed subsequent to the endogenous latent variables' coefficient of determination. The effect size is the difference in R2 between the main effects when one exogenous latent variable is included in the model and when it is also removed. This is often done to test whether the endogenous variable is significantly affected by the external latent variable that was left out (Hair et al., 2013). Thus, the effect size of the exogenous latent variable might be calculated using the following formula (Cohen, 1988, et al., 2012).

According to Hair et al (2013) advice, the formula above f^2 values of 0.02, 0.15, and 0.35 indicated Small, Moderate, and Substantial effects, respectively (Cohen, 1988). For the effect size, refer to Table 6.2.

Table 14: Determination of the Effects Size; F-Square (f^2)

Constructs	f^2	Effect Size
PL -> OP	0.090	Small
SV -> OP	0.057	Moderate

Source: Smart-PLS Output (2025)

The effect of operational management on organisational performance is displayed in Table 6.2. The exogenous variables that have a minor effect on operational management which include inventory, product development, planning and supervision. According to Cohen's (1988) criteria for effect size interpretation, the results also suggest that the effects of these four exogenous latent variable on operational performance can be categorised as small, moderate, and substantial, respectively.

4.13: Assessment of Predictive Relevance: Q-Squared

As a measure of prediction accuracy, researchers are advised to look at Stone-Geisser's Q2 value in addition to

the R2 value level (Geisser, 1974; Stone, 1974). The predictive utility of a model is measured by this criterion (Hair et al., 2014). But according to Stone (1974) and Duarte and Roposo (2010), this criterion can be seen as an extra assessment of the model fit in the PLS-SEM analysis. Consequently, the Q2 shows how well the model and its parameter estimations produce the observed values (Chin, 1998).

This work employed a cross-validated redundancy criteria to examine the predictive relevance (Q2) of the exogenous latent variables on the reflective endogenous latent variable (Hair et al., 2014; Hair, Ringle, & Sarstedt, 2013; Ringle et al., 2012; Stone, 1974). Accordingly, if the Q2 is larger than zero, the model is deemed to have predictive value (Henseler et al., 2009); the higher the Q2, the more predictively relevant the model is (Duarte & Roposo, 2010). The blindfolding method was used to determine the Q2 value, which is shown in Table 6.3.

The capacity of the external latent variables to predict the endogenous latent variable was also evaluated using Stone-Geisser's Q2 value in this model (Geisser, 1974; Stone, 1974). A cross-validated redundancy criterion was applied to measure the predictive relevance (Q2) using the blindfolding procedure. Table 6.3 presents the findings to be as OM with a Q2 value of 0.348 and OP with Q2 value of 0.405.

Table 15: Predictive relevance on endogenous variables: Q-square

Construct	Q^2 (=1-SSE/SSO)
OM	0.348
OP	0.405

Source: Smart-PLS Output (2025)

4.14: Discussion of the Findings

The study that was conducted to investigate the relationship between operational management and organisation performance of food and beverage companies in Kaduna metropolis. Firstly, HO1: Operational management has no significant influence on organisational performance of food and beverages companies in Kaduna Metropolis. Analysis of the collected data revealed that operational management has significant influence on organisational performance with a Beta coefficient of 0.692 and a p-value of 0.000. This signifies that operational management has significant influence on organisational performance of food and beverages companies in Kaduna

metropolis as described by t-statistics of 37.590 and STDEV value of 0.016. The findings have no correlated with the hypothesis (HO1), which is therefore rejected by the study.

The finding of this study implies that improving the performance of food and beverage companies in Kaduna Metropolis requires the use of efficient operational management techniques. This implies that in order to increase productivity and profitability, businesses should give top priority to tactics such effective resource allocation, process optimisation, quality control, and supply chain management. It also emphasises how crucial it is to spend in infrastructure, technology, and management expertise in order to maintain competitive advantage and corporate expansion. Legislators and company owners could also think about enacting regulations and educational initiatives that improve operational effectiveness.

For business leaders, this suggests the need to create a culture of continuous improvement and invest in innovative solutions to complement operational strategies. Policymakers and industry stakeholders can also play a role by promoting an atmosphere that supports research, development, and technological breakthroughs within the sector.

Table 16*:* Summary of test of hypothesis

S/N	NULL HYPOTHESES	REMARK
1	HO1: Operational management has no significant influence on organizational performance of food and beverage firms in Kaduna metropolis.	Rejected

The test of hypothesis using PLS-SEM analysis found that; operational management has a significant influence on organisational performance of food and beverages companies in Kaduna metropolis.

This study examined the effect of operational management practices on the performance of food and beverage companies in Kaduna Metropolis, with innovation serving as a moderating variable. Drawing from empirical analysis, the study concludes that operational management practices are critical determinants of organizational performance in the food and beverage industry.

The findings reveal that effective planning and supervision significantly enhance organizational performance by improving efficiency, reducing operational costs, and ensuring consistent output quality. Structured planning enables firms to allocate resources optimally and anticipate operational challenges, while effective supervision enhances employee

productivity, coordination, and adherence to operational standards. These findings align with Systems Theory, which emphasizes that organizational performance is a function of the effective interaction and coordination of interdependent subsystems.

5.0: Conclusion

The study concludes that operational management in terms of effective planning and supervisions strengthens the organizational performance of food and beverages businesses. Firms that integrate in to their operational processes through improved methods, technologies, and managerial practices achieve superior performance outcomes compared to firms that rely solely on traditional operational approaches.

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