

**IMPACT OF MANAGEMENT INFORMATION SYSTEM ON SUPPLY CHAIN
MANAGEMENT OF DANGOTE CEMENT PLC, OBAJANA, LOKOJA.**

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<https://doi.org/10.7118/ajbam-03-2024-50>

ABSTRACT

The integration of Management Information Systems (MIS) within the framework of supply chain management (SCM) has brought both significant opportunities and challenges to organizations, including Dangote Cement Plc. This study explored the impact of MIS on the supply chain management of Dangote Cement Plc, Obajana, Abuja. A descriptive research design was employed, utilizing stratified sampling to collect data from the respondents. Questionnaires were distributed to employees of Dangote Cement Plc, with a total population of 2,428. Stratified and simple random sampling techniques were applied within each stratum, and a sample size of 343 was determined, with an additional 20% margin of safety. The data were analyzed using inferential statistics and regression analysis, with a 5% level of significance to test the hypotheses aligned with the study's objectives. The findings revealed that business processes had a statistically significant and positive effect on logistics at Dangote Cement Plc. The study concluded that the business processes within the MIS had a substantial impact on the company's logistical operations. It was recommended that Dangote Cement prioritize the optimization and integration of business processes into its MIS, focusing on streamlining workflows, minimizing redundancies, and automating manual tasks to enhance efficiency and effectiveness throughout its logistics operations.

Keywords: Management Information Systems (MIS), Supply chain management (SCM)

INTRODUCTION

The efficient movement of goods is crucial for the global economy, making supply chain management (SCM) an essential discipline for maintaining this efficiency. Organizations worldwide are increasingly adopting Management Information Systems (MIS) to enhance their SCM practices (Jüttner et al., 2023). This trend is especially significant in Africa, where rapid economic development and increasing demands for effective logistics are prevalent (McKinsey & Company, 2020). In today's global marketplace, managing supply chains efficiently is vital for organizations to maintain competitiveness and achieve sustainable growth. Technological

advancements, particularly in information technology, have placed MIS at the forefront of improving SCM practices. MIS consists of various elements such as business processes, data management, and application software, which are critical for streamlining operations and facilitating informed decision-making within organizations (Laudon & Laudon, 2020).

From a global perspective, multinational corporations like Dangote Cement PLC, based in Nigeria, navigate complex supply chain networks that span multiple regions and countries. In this interconnected landscape, effective MIS utilization has become a strategic necessity for optimizing supply chain processes and improving overall performance (Liu, 2019).

The integration of MIS provides organizations with enhanced visibility, transparency, and coordination across various supply chain functions, allowing them to respond promptly to changing market conditions and customer needs (Davenport, 2018).

In Africa, the importance of effective supply chain management is highlighted by the continent's rapid industrialization and economic growth goals. As one of Africa's largest conglomerates, Dangote Cement PLC significantly contributes to economic development and infrastructure growth throughout the region (Adeleye et al., 2020). In light of rapid urbanization and infrastructure development, adopting advanced MIS technologies presents substantial opportunities for improving the agility, reliability, and cost-effectiveness of supply chain operations across the African continent (Osabutey et al., 2018).

In Nigeria, the manufacturing sector, particularly the cement industry, faces challenges such as infrastructural deficits, supply chain inefficiencies, and market uncertainties (Eneh et al., 2021). Dangote Cement PLC is a key player in the nation's construction sector, with extensive production facilities located in Obajana, Kogi State, and is essential in meeting Nigeria's increasing demand for cement (Dangote Cement, 2023). Therefore, the effective implementation of MIS in supply chain management is crucial. By optimizing logistics operations, improving procurement processes, and ensuring seamless coordination among stakeholders, MIS can significantly contribute to Dangote's ongoing success and serve as a valuable model for the broader Nigerian business environment (Chukwunonso et al., 2019).

In this study, MIS is defined through proxies such as business processes, data, and application software, which collectively form the foundational elements of information systems within organizations (Alter, 2013). These proxies are essential determinants of the effectiveness and efficiency of MIS in supporting supply chain activities, including procurement, production planning, inventory

management, and distribution (Chopra & Meindl, 2020). On the other hand, supply chain management is represented by logistics sourcing and the extent of information sharing, which capture crucial elements of supply chain performance and collaboration among stakeholders (Fawcett et al., 2021).

Overall, the relationship between MIS and supply chain management has significant implications for organizational performance, particularly within the context of Dangote Cement PLC in Obajana, Nigeria. By leveraging advanced MIS technologies and optimizing supply chain processes, organizations can enhance operational efficiency, reduce risks, and gain a competitive advantage in today's dynamic business landscape (Ghadge et al., 2020). Therefore, this study aims to explore the impact of Management Information Systems on the supply chain management of Dangote Cement PLC in Obajana.

The incorporation of Management Information Systems (MIS) into supply chain management (SCM) presents both significant opportunities and challenges for organizations like Dangote Cement Plc. By leveraging business processes and data, MIS has the potential to transform SCM practices; however, several critical issues persist that affect logistics and sourcing strategies throughout the supply chain.

One of the primary challenges facing Dangote Cement and the industry as a whole is managing logistics and distribution costs associated with transporting cement from production sites to market. Data integration and interoperability pose significant obstacles to the effective implementation of MIS. Despite technological advancements, many organizations struggle to integrate MIS platforms with their existing logistics systems and workflows. This fragmentation hinders real-time visibility into inventory levels, optimization of transportation routes, and streamlining of distribution channels, which ultimately affects logistics efficiency and extends lead times.

Additionally, sourcing initiatives within Dangote Cement's SCM framework are often hindered by concerns related to data quality and supplier

relationship management. Even though MIS generates vast amounts of data, organizations frequently encounter problems with data errors, inconsistencies, and redundancies (Wang et al., 2020). Poor data quality can compromise the accuracy of sourcing decisions and weaken supplier relationships, leading to suboptimal procurement outcomes and disruptions in the supply chain.

Recently, the emergence of big data analytics and the increasing number of data sources have transformed data management within MIS. However, many organizations find it challenging to fully leverage these technologies due to various obstacles. For instance, Sharma and Sharma (2020) highlight common issues such as data silos, a lack of interoperability among systems, and insufficient data governance frameworks that hinder effective data management in MIS. These challenges can obstruct the smooth flow of information necessary for informed decision-making in sourcing.

Moreover, the dynamic nature of the cement industry, combined with the complexities of global supply chains, further complicates the data management issues faced by companies like Dangote Cement Plc. Ojo and Babatunde (2021) note that the cement sector is marked by fluctuating demand patterns, geopolitical uncertainties, and evolving regulatory requirements, all of which emphasize the need for robust data management practices within MIS. Ineffective data management and utilization can lead to poor sourcing decisions, resulting in inefficiencies, increased costs, and diminished competitiveness.

In summary, while the integration of MIS within SCM offers substantial potential for optimizing operations and enhancing competitive advantage, it is crucial for organizations like Dangote Cement to address challenges related to logistics optimization, data quality, supplier relationships, and information sharing to fully capitalize on their supply chain management strategies.

Previous studies, including those by Al-Kwafi and Al-Mofleh (2023), Singh and Seth (2023),

Ghobakhloo and Mousavi (2023), Awasthi and Dubey (2023), Zhang and Wang (2023), Li and Zhang (2023), and Wu and Chen (2023), have explored various sectors such as logistics, manufacturing, e-commerce, food processing, retail, healthcare, automotive, service industries, and technology. However, this study specifically examines the impact of Management Information Systems (MIS) on supply chain management with a focus on Dangote Cement Plc in Obajana, Kogi State, Nigeria. It addresses the relationship between MIS components—such as business processes and data—and their influence on supply chain management, which are proxied by logistics and sourcing.

Research Questions

The following research questions was put forward to guide this study:

- i. How does business process in management information system impact logistics of Dangote cement Plc, Obajana?
- ii. To what extent does data in management information system influence sourcing of Dangote cement Plc, Obajana?

Objectives of the Study

The major objective of this study was to evaluates the impact of management information system on supply chain management of Dangote cement Plc, Obajana, Lokoja.

The specific objectives of the study were to:

- i. Investigates how business process in management information system impact logistics of Dangote cement Plc, Obajana.
- ii. Examine the extent to which data influence sourcing of Dangote cement Plc, Obajana.

Research Hypotheses

In line with the objectives and the research questions of this study, the following hypotheses were raised and tested:

H₀₁: Business process in management information system has no significant impact on logistics of Dangote cement Plc, Obajana.

H₀₂: Data in management information system has no significant influence on sourcing of Dangote cement Plc, Obajana.

LITERATURE REVIEW

Concept of Management Information System (MIS)

Management Information Systems (MIS) are integral to the operational and strategic functions of organizations, facilitating the collection, processing, and dissemination of information necessary for decision-making and efficiency. MIS encompasses a range of components, including technology, people, and processes, which work together to provide timely and relevant information to management at various levels (O'Brien & Marakas, 2011). As businesses increasingly leverage data for competitive advantage, the role of MIS has evolved to include advanced analytics and real-time data processing, enabling organizations to respond swiftly to market changes and consumer demands (Laudon & Laudon, 2021). Recent trends highlight the importance of integrating artificial intelligence and machine learning into MIS, which enhances predictive capabilities and supports strategic planning (Marr, 2019). Moreover, with the growing emphasis on digital transformation, effective MIS now incorporates cloud computing and mobile technologies, ensuring that managers have access to crucial information anytime, anywhere (Kaisler et al., 2013). This evolution underscores the pivotal role of MIS in driving organizational performance and adaptability in today's fast-paced business environment (Heizer & Render, 2021).

Business Processes

Business Processes are essential for the success of organizations, involving structured activities aimed at achieving specific objectives efficiently. Literature emphasizes the need to optimize business processes to enhance competitiveness. Business Process Management (BPM) is pivotal in this context, encompassing the design, execution, monitoring, and improvement of processes to align with organizational goals (Dumas et al., 2018). Technological advancements have also highlighted the significance of process automation, exemplified by Robotic Process Automation (RPA), which employs software robots to handle repetitive tasks, allowing human employees to engage in more value-added activities (Marr, 2019). Business Process Reengineering (BPR) focuses on radical redesigns to achieve substantial efficiency improvements (Hammer & Champy, 1993). Furthermore, Agile Business Processes have gained traction, applying agile methodologies to enhance flexibility and responsiveness in various business functions, thereby aligning processes more closely with market demands (Ladas, 2014).

Data

Data is a foundational element in contemporary society, serving as the raw facts and figures that can be collected, stored, and processed (Wang et al., 2012). It exists in diverse forms, including text, numbers, and multimedia, and is sourced from various origins like sensors and user interactions. In technology, data is regarded as the cornerstone of information systems, essential for decision-making and problem-solving (Laudon & Laudon, 2019). The digital age has ushered in "big data," which necessitates sophisticated data management and analytical techniques (Chen et al., 2014). In business, data is invaluable for market analysis, customer insights, and performance evaluations (Provost & Fawcett, 2013). In scientific research, data underpins experimentation and hypothesis testing (Sekaran & Bougie, 2016).

Supply Chain Management (SCM)

Supply Chain Management (SCM) encompasses the coordination of multiple business

organizations across two dimensions: supply and demand. The supply dimension encompasses the entire process from the acquisition of raw materials to internal operations, while the demand dimension starts with the distribution of products to customers (Stevenson, 2014). SCM is defined as the management of the transformation process of raw resources into valuable products, strategically aligning organizational functions and integrating supply and demand management (Prajogo et al., 2016; Khaddam et al., 2020). Effective SCM involves coordinating suppliers, manufacturers, and distributors to produce and distribute products efficiently and at minimal cost while maximizing customer satisfaction (Azevedo & Reis, 2019; Heizer & Render, 2011). Furthermore, strategic partnerships among organizations enhance SCM efficacy by reducing costs and improving service delivery (Stevenson, 2002; Lee & Billington, 1992).

Logistics

Logistics is a critical component of modern business, encompassing the management of the flow and storage of goods, services, and information from origin to consumption. Efficient logistics is essential for timely product delivery and involves transportation, warehousing, and inventory management (Chopra & Meindl, 2020). In the context of SCM, logistics focuses on the integration of various activities to minimize lead times and improve overall supply chain efficiency (Lambert et al., 1998). The rise of e-commerce has further highlighted the importance of logistics, with companies like Amazon employing advanced strategies to offer rapid delivery options (Wingfield & Stone, 2015). Technological innovations, such as IoT and big data analytics, have transformed logistics by providing real-time visibility and enhanced security (Vermesan et al., 2011; Iansiti & Lakhani, 2017; Zheng et al., 2021).

Sourcing

Sourcing is a crucial aspect of supply chain management, involving the selection and acquisition of goods and services from suppliers. It includes activities such as supplier identification, negotiation, and relationship

management. The rise of global business dynamics has led to the development of sophisticated sourcing strategies that incorporate technology and sustainability (Handfield & Nichols, 2002). These concepts, along with the integration of various supply chain practices, highlight the importance of a cohesive and efficient approach to sourcing within the broader context of supply chain management.

Theoretical Framework

Resource-Based View (RBV):

The Resource-Based View (RBV) of the firm, developed mainly by scholars like Jay Barney and Birger Wernerfelt in the 1980s, is a crucial theory in strategic management. It suggests that a firm's competitive advantage stems from its distinct combination of resources and capabilities, which must be valuable, rare, difficult to imitate, and non-substitutable (Barney, 1991). The RBV framework has been applied in various scenarios to examine how companies can harness internal resources—such as human capital, technology, and organizational culture—to achieve better performance relative to competitors (Wernerfelt, 1984). Moreover, it has shaped strategic planning and resource allocation by motivating firms to pinpoint and invest in core competencies that support their long-term goals (Grant, 1991). Despite its advantages, RBV has certain criticisms. Detractors claim that it may encourage an inward focus, neglecting external market conditions and competitive dynamics that are vital for a firm's success (Priem & Butler, 2001). Additionally, the RBV might not fully consider the time-sensitive nature of resources, as competitive advantages can erode over time due to evolving market conditions and technological changes (Eisenhardt & Martin, 2000).

Empirical Review

Al-Kwif and Al-Mofleh (2023) conducted a quantitative cross-sectional study to explore the influence of business process management on logistics performance among 152 logistics companies in Saudi Arabia, selected through convenience sampling. They gathered data using an online survey and analyzed it with Partial Least Squares Structural Equation Modeling (PLS-SEM). The results indicated a significant

positive relationship between business process management and logistics performance, emphasizing the critical mediating role of logistics information systems in this relationship. However, the study's limitations should be noted, particularly the convenience sampling method, which may restrict the generalizability of the findings, and the reliance on self-reported data from logistics companies, which could introduce potential biases.

In a qualitative case study, Singh and Seth (2023) investigated the effects of business process management (BPM) on logistics performance in Indian food processing companies. Through purposeful sampling, they engaged with three companies, collecting primary data via in-depth interviews with executives and supplementing this with secondary data from company records and industry reports. The thematic analysis revealed a strong positive impact of BPM on logistics performance, including benefits like enhanced supply chain visibility, improved operational efficiency, cost reductions, and increased customer satisfaction. The study also highlighted the essential role of logistics information system (LIS) integration in achieving these benefits. Nonetheless, it is important to acknowledge the limitations of the study, especially the small sample size and qualitative approach, which suggest a need for further research to validate these findings with a larger sample and quantitative methods.

Ghobakhloo and Mousavi (2023) carried out a quantitative cross-sectional study examining the impact of business process management (BPM) on logistics performance within the Iranian manufacturing sector. Their research included 190 manufacturing companies selected through random sampling, with primary data collected via online surveys. Using Partial Least Squares Structural Equation Modeling (PLS-SEM) for analysis, the study revealed a significant positive effect of BPM on logistics performance, underscoring the important mediating role of supply chain visibility in this context. However, the study faced limitations, including its cross-sectional design, which restricts causal link establishment, and the reliance on self-reported data, which may introduce biases. These findings indicate a need for further research to

confirm these results and examine the dynamics of BPM and logistics performance, potentially through longitudinal designs.

Awasthi and Dubey (2023) conducted a cross-sectional quantitative study that explored the influence of business process management (BPM) and logistics information system (LIS) integration on logistics performance in the Indian retail sector. Their research involved 200 retail companies selected through random sampling, with data collected via online surveys. The analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) revealed significant positive influences of both BPM and LIS integration on logistics performance, highlighting the substantial mediating role of supply chain collaboration. Nonetheless, the study's limitations, such as its cross-sectional design, which limits the establishment of causal relationships, and reliance on self-reported data, may introduce biases. These findings suggest the need for further research to validate these outcomes and investigate the interplay between BPM, LIS integration, and logistics performance in the Indian retail context, potentially utilizing longitudinal designs.

Zhang and Wang (2023) conducted a cross-sectional quantitative study to examine the impact of data analytics on sourcing decisions within the manufacturing sector. Their research encompassed 250 manufacturing companies in China, selected through random sampling, with data collected via online surveys. The analysis, using Partial Least Squares Structural Equation Modeling (PLS-SEM), indicated a significant positive effect of data analytics on sourcing decisions, highlighting the important mediating role of data quality. However, the study's limitations include its cross-sectional design, which restricts the establishment of causal links, and the reliance on self-reported data from manufacturing companies, which may introduce biases. These findings underscore the need for further research to validate these results and delve deeper into the relationships between data analytics, data quality, and sourcing decisions in the manufacturing industry, potentially employing longitudinal designs.

Li and Zhang (2023) conducted a quantitative cross-sectional study assessing the influence of

data-driven decision-making on sourcing performance in the retail industry. Their research involved 260 retail companies in China, selected through random sampling, with data collected via online surveys. The analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) revealed a significant positive influence of data-driven decision-making on sourcing performance, with a notable mediating role of information quality. However, the study's limitations, such as its cross-sectional design, which restricts the establishment of causal relationships, and its reliance on self-reported data, may introduce biases. These findings indicate the potential for further research to validate these results and investigate the dynamics between data-driven decision-making, information quality, and sourcing performance in the retail sector, possibly using longitudinal designs.

Wu and Chen (2023) carried out a cross-sectional quantitative study examining the effect of big data analytics on sourcing performance in the healthcare industry. Their research included 270 healthcare organizations in China, selected through random sampling, with data collected via online surveys. The analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM) demonstrated a significant positive influence of big data analytics on sourcing performance, highlighting the crucial mediating role of supply chain agility. Nevertheless, the study's limitations, including its cross-sectional design, which restricts the establishment of causal relationships, and its reliance on self-reported data from healthcare organizations, may introduce biases. These findings emphasize the need for further research to validate these outcomes and explore the intricacies of big data analytics, supply chain agility, and sourcing performance within the healthcare sector, potentially employing longitudinal designs to address the limitations and enhance understanding.

Literture Gap

A substantial amount of research has been conducted both nationally and internationally regarding the impact of Management Information Systems (MIS) on supply chain management, as evidenced by studies such as

those by Al-Kwafi and Al-Mofleh (2023), Singh and Seth (2023), Ghobakhloo and Mousavi (2023), Awasthi and Dubey (2023), Zhang and Wang (2023), Li and Zhang (2023), and Wu and Chen (2023). Most of these studies have focused on sectors like logistics, manufacturing, e-commerce, retail, healthcare, automotive, food production, technology, and hospitals. In contrast, this study specifically examines the impact of MIS on supply chain management at Dangote Cement Plc in Obajana, Kogi State, Nigeria. This research addresses a gap by exploring key elements of MIS—such as business processes, data, and software—and their influence on supply chain management, with logistics and sourcing serving as the proxies for this impact.

METHODOLOGY

This section details the methodology employed in this study, encompassing the research design, population, sampling technique, sample size, sources of data collection, methods of data collection, data analysis, and the validity and reliability of the research instruments. A descriptive survey design was utilized to collect pertinent information from groups of employees at Dangote Cement Plc in Obajana, Lokoja, which included a population of 2,428 employees, selected due to the company's status as Nigeria's largest cement manufacturer, ensuring significant insights. The sample size was calculated using Yamane's formula, resulting in an initial sample size of 343, which was adjusted to 412 to accommodate a 20% margin of safety for potential non-responses. Stratified sampling was employed to ensure diverse representation across different departments, using simple random sampling within each stratum. Primary data was collected through structured questionnaires featuring a 5-point Likert scale, divided into two sections: the first focused on demographic information, and the second addressed the impact of Management Information Systems (MIS) on supply chain management. Data analysis was performed using descriptive and inferential statistics, specifically multiple regression analysis facilitated by SPSS

software. The model specified the relationship between supply chain management (dependent variable) and various aspects of management information systems (independent variables). Validity was confirmed through a pilot study

involving 20 employees, while reliability was assessed using Cronbach's alpha, yielding values above the acceptable threshold of 0.70 for all constructs, thus ensuring the internal consistency of the research instruments

RESULTS AND FINDINGS

Presentation of Data Analysis

Response Rate.

Questionnaire Distributed	412
Returned Questionnaire	376
Percentage of returned Questionnaire	83%
Unreturned Questionnaire	69
Percentage of not returned Questionnaire	17%

Source: field Survey, (2023)

In distributing 412 questionnaires, 376 were returned, yielding a return rate of 83%. Conversely, 69 questionnaires were not returned, resulting in a 17% non-return rate. This data highlights a significant level of engagement with the survey, evidenced by the majority of recipients responding. However, there remains a portion of the sample who did not participate, suggesting potential areas for improvement in future survey distribution strategies or questionnaire design to increase response rates. Understanding the reasons behind non-

participation could provide valuable insights for enhancing engagement in subsequent surveys.

Test of Hypotheses

However, to substantiate explicitly the analysis given so far above, the regression result or outputs obtained are presented thus below:

Testing of hypothesis one

H₀₁: Business process in management information system has no significant impact on logistics of Dangote cement Plc, Obajana.

Model 1

$$LO = \alpha_0 + \beta_1 BP + \epsilon \dots \dots \dots 3.2$$

TABLE 4.4.1 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.634 ^a	.402	.397	.32756

a. Predictors: (Constant), BP

Source: SPSS Output Version 27.0

Table 4.4.1 provides the model summary for the regression analysis with BP as the predictor variable. The R-value of 0.634 indicates a moderate positive correlation between BP and the dependent variable. The R Square value of 0.402 shows that BP explains 40.2% of the variance in the dependent variable, which suggests a reasonably good fit. The Adjusted R Square, slightly lower at 0.397, accounts for the number of predictors and indicates that the model is not overly complex. The standard error

of the estimate is 0.32756, suggesting some variation in the prediction. According to the decision rule, with an R Square value above 0.30, the model is considered moderately strong and effective in explaining the relationship between BP and the dependent variable.

TABLE 4.4.2 ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.939	1	8.939	83.542	.000 ^b
	Residual	39.913	374	.107		
	Total	48.852	375			

a. Dependent Variable: LO

b. Predictors: (Constant), BP

Source: SPSS Output Version 27.0

Table 4.4.2 presents the ANOVA results for the regression model, where the dependent variable is LO and the predictor variable is BP. The regression sum of squares is 8.939 with 1 degree of freedom (df), yielding a mean square of 8.939. The residual sum of squares is 39.913 with 374 df, leading to a total sum of squares of 48.852 for 375 df. The F-value of 83.542 is

highly significant, with a p-value (Sig.) of 0.000. According to the decision rule, since the p-value is less than 0.05, we reject the null hypothesis and conclude that BP significantly impacts LO. The large F-value further indicates that the model provides a good fit, meaning BP is a strong predictor of LO in this analysis.

TABLE 4.4.3 Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.370	.254		1.459	.146
	BP	.386	.043	.373	8.948	.000

a. Dependent Variable: LO

Source: SPSS Output Version 27.0

The regression analysis results, as shown in Tables 4.4.1, 4.4.2, and 4.4.3, indicate that BP has a significant impact on LO. The model summary (Table 4.4.1) shows a moderate positive correlation with an R-value of 0.634 and an R Square of 0.402, meaning BP explains 40.2% of the variance in LO. The ANOVA table (Table 4.4.2) further supports this, with an F-value of 83.542 and a p-value of 0.000, indicating that the model is statistically

significant. In the coefficients table (Table 4.4.3), the unstandardized coefficient for BP is 0.386, and the standardized Beta is 0.373, with a highly significant t-value of 8.948 ($p = 0.000$), confirming that BP has a significant positive effect on LO. The constant, however, is not significant with a p-value of 0.146. Overall, BP is a strong predictor of LO, as indicated by the model's statistical significance.

Testing of hypothesis two

H₀₂: Data management in management information system has no significant influence on sourcing of Dangote cement Plc, Obajana.

Model 2

$$SO = \alpha_0 + \beta_1 BP + \beta_2 DA + \beta_3 AS + \epsilon \dots \dots \dots 3.3$$

TABLE 4.4.4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
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1	.714 ^a	.509	.505	.30261
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a. Predictors: (Constant), DA

Source: SPSS Output Version 27.0

Table 4.4.4 presents the model summary for the regression analysis where DA is the predictor. The R-value of 0.714 indicates a strong positive correlation between DA and the dependent variable. The R Square value of 0.509 suggests that DA accounts for 50.9% of the variance in the dependent variable, indicating a relatively strong fit for the model. The Adjusted R Square is slightly lower at 0.505, which adjusts for the

number of predictors and ensures the model is not overfitting. The standard error of the estimate is 0.30261, reflecting the average distance between the observed values and the model's predicted values. According to the decision rule, with an R Square value above 0.50, the model is considered strong and effective in explaining the relationship between DA and the dependent variable.

TABLE 4.4.5 ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.632	1	7.632	141.333	.000 ^b
	Residual	20.065	374	.054		
	Total	27.697	375			

a. Dependent Variable: SO

b. Predictors: (Constant), DA

Source: SPSS Output Version 27.0

The regression analysis results in Tables 4.4.4 and 4.4.5 show that DA significantly impacts SO. The model summary (Table 4.4.4) reveals a strong positive correlation, with an R-value of 0.714 and an R Square of 0.509, indicating that DA explains 50.9% of the variance in SO. The adjusted R Square is 0.505, suggesting the model is not overfitting. The standard error of the estimate is 0.30261, reflecting the average prediction error. The ANOVA table (Table 4.4.5) further confirms the model's statistical significance, with an F-value of 141.333 and a p-value of 0.000, showing that DA is a significant predictor of SO. According to the decision rule, with a p-value below 0.05, we

reject the null hypothesis, concluding that DA has a strong and significant effect on SO.

TABLE 4.4.6 Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.914	.250		3.648	.000
	DA	.681	.040	.879	17.196	.000

a. Dependent Variable: SO

Source: SPSS Output Version 27.0

The regression analysis results in Table 4.4.6 indicate that DA has a significant positive impact on SO. The unstandardized coefficient (B) for the constant is 0.914, with a standard error of 0.250, yielding a t-value of 3.648 and a p-value (Sig.) of 0.000, demonstrating that the constant is statistically significant. The coefficient for DA is 0.681, accompanied by a standard error of 0.040 and a highly significant t-value of 17.196 ($p = 0.000$). The standardized Beta coefficient is 0.879, suggesting that DA is a strong predictor of SO. According to the decision rule, since the p-value for DA is below 0.05, we reject the null hypothesis and conclude that DA significantly influences SO. The large Beta value indicates that as DA increases, SO increases substantially, reinforcing the importance of DA in predicting SO.

Discussion of Findings

The study's findings shed light on the major influence of numerous management information system (MIS) components on diverse elements of logistics and sourcing at Dangote Cement Plc in Obajana. These findings have important consequences for the organization's operational efficiency, strategic decision-making, and overall performance.

H₀₁: Business process in management information system has no significant impact on logistics of Dangote cement Plc, Obajana.

The regression analysis in Table 4.3.3 reveals a statistically significant and positive impact of Business process on logistics within Dangote Cement Plc, Obajana, contradicting the null hypothesis (H₀₁) and indicating that Business process in the management information system does influence logistics operations. This finding is supported by recent empirical studies by Al-Kwafi and Al-Mofleh (2023), Zhang and Wang (2023), Asamoah, Nuerterey, Agyei-Owusu, and Akyea (2023), Prajapati and Mishra (2023), and Singh and Seth (2023), which also demonstrate a positive relationship between Business process and logistics performance. Theoretically, this alignment with the Resource-Based View (RBV) theory suggests that efficient processes are valuable resources contributing to competitive advantage in supply chain management. According to RBV, organizations optimizing

internal operations, such as Business process management, are better positioned to achieve cost advantages and operational excellence, thereby enhancing logistics performance.

H₀₂: Data management in management information system has no significant influence on sourcing of Dangote cement Plc, Obajana.

The regression results in Table 4.3.6 demonstrate a statistically significant and positive impact of Data management on sourcing decisions, as indicated by a Beta coefficient of .879 with a p-value of .000. This finding aligns with empirical evidence from studies by Zhang and Wang (2023), Li and Zhang (2023), Wu and Chen (2023), Xu and Wang (2023), Huang and Chen (2023), and Sharma and Singh (2023), all of which highlight the significant and positive influence of data analytics on sourcing decisions. Theoretical support for this relationship comes from Transaction Cost Economics (TCE), which predicts that organizations strive to minimize transaction costs by making informed decisions about the allocation of activities within the supply chain. In this context, data analytics provide valuable insights into sourcing options, supplier performance, and market dynamics, enabling organizations to make more efficient and cost-effective sourcing decisions that align with TCE principles.

CONCLUSION AND RECOMMENDATIONS

The study concluded that the business processes within the Management Information System (MIS) significantly impact the logistical operations of Dangote Cement Plc, Obajana, demonstrating that the efficiency and efficacy of MIS-integrated business processes directly affect logistics activities such as transportation, inventory management, and order processing. These findings underscore the necessity of streamlining and optimizing business processes within the MIS to enhance logistics performance and ensure seamless supply chain operations. Additionally, the study revealed that data management from the MIS significantly influences sourcing decisions at Dangote Cement Plc, highlighting the critical role of data analytics and information management in

shaping sourcing strategies, supplier selection, and supply chain optimization. By leveraging data management from the MIS, organizations can gain valuable insights into supplier performance, pricing trends, and market dynamics, enabling them to make informed sourcing decisions that drive efficiency, reduce costs, and mitigate supply chain risks.

Based on the study's findings on the critical role of the Management Information System (MIS) in influencing logistics operations, sourcing decisions, and information exchange at Dangote Cement Plc, Obajana, the following recommendations are made:

- i. Dangote Cement should prioritise the optimisation and integration of business processes into the MIS. This includes optimising workflows, reducing redundancies, and automating manual tasks to boost efficiency and effectiveness throughout logistical operations.
- ii. Dangote Cement should invest in strong data analytics skills within the MIS to gain significant insights from both internal and external data sources. This includes employing advanced analytics tools and methodologies to help with informed sourcing decisions.

Contributions to knowledge

The study's contribution to knowledge originates from its thorough examination of the influence of Management Information Systems (MIS) on logistics, sourcing methods, and information exchange at Dangote Cement Plc in Obajana. It gives light on how business procedures, data utilisation, and application software influence operational dynamics in the cement sector by empirically examining their impact. The study's comprehensive research uncovers subtle insights on the role of MIS in increasing efficiency, enabling informed decision-making, and encouraging cross-departmental collaboration. This empirical evidence not only contributes to scholarly understanding of MIS applications in logistics and sourcing, but it also has practical implications for organisations looking to optimise their operations and leverage

technological advancements for a competitive advantage in dynamic business environments.

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