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# ENGINEERING INNOVATIONS AND ECONOMIC POLICIES: DRIVING SUSTAINABLE INDUSTRIAL GROWTH IN NIGERIA

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## Table of Content

# 024-An Assessment of Critical Challenges in Supply Chain Management: Evidence from the Nigerian Construction Industry

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**Abstract:** This study assesses the critical challenges in Supply Chain Management (SCM) within the Nigerian construction industry. A quantitative survey was administered to 150 construction professionals in Abuja, utilizing a structured questionnaire with a 5-point Likert scale. Data were analyzed using descriptive statistics. Findings reveal that the current state of SCM is poor, with delay in material delivery emerging as the most severe challenge (Mean = 4.2, SD = 0.8), followed by poor stakeholder coordination and lack of transparency. The study provides empirical evidence of systemic SCM inefficiencies and establishes a diagnostic baseline such as the adoption of digital tools like Internet of things (IoT) and cloud computing for effective management. Hence, the study recommends for future research on implementation strategies of such tools for effective policy formulation in the industry.

*Keywords:* Critical, Challenges, Supply chain, Management, Industry

## 1. INTRODUCTION

The construction industry plays a vital role in the economic growth and infrastructure development of nations, including Nigeria. However, its performance is often hampered by inefficiencies in supply chain management (SCM), which is critical for ensuring timely delivery of materials, cost control, quality assurance, and stakeholder coordination (Ekanayake *et al.,* 2021). In the Nigerian context, the construction supply chain is frequently disrupted by factors such as poor logistics, unreliable suppliers, lack of skilled personnel, and inconsistent regulatory frameworks (Adebowale *et al*., 2022). Unlike manufacturing, where SCM practices are more standardized and predictable, construction projects are unique, complex, and location-dependent (Adegoke, 2022). The Nigerian construction industry continues to struggle with supply chain inefficiencies, which significantly impact project delivery, cost, and quality (Agi and Nishant, 2017), Key challenges such as delays in material procurement, weak coordination among stakeholders, and lack of transparency in supply chain operations have led to frequent project disruptions and financial losses (Oke *et al*., 2018). These issues are further intensified by the sector's reliance on outdated, manual methods of managing supply chain activities, making the processes prone to errors, miscommunication, and inefficiencies (Akinade et al., 2015). In addition, limited technological adoption, lack of transparency, and inconsistent procurement practices further weaken supply chain performance (Ajayi et al., 2017). These challenges are not only technical but also institutional, reflecting deeper systemic issues such as corruption, bureaucratic bottlenecks, and insufficient stakeholder collaboration. Study by Ibeawuchi (2018) revealed that the inefficiencies in Nigerian SCM does not only escalate project costs but also undermine the overall productivity and competitiveness of the industry. Despite the growing recognition of SCM as a driver of project success, research focused specifically on the supply chain dynamics within the Nigerian construction context remains limited. Most construction firms operate reactively rather than strategically, often addressing issues only after they escalate (Aghimien et al., 2020). Understanding the critical barriers to effective SCM is therefore, essential for developing targeted strategies that improve project delivery and sustainability in the industry. Hence, the need for the current study. This implies that the need for this study arises from the glaring gaps in the current state of SCM within Nigeria's construction industry. Based on the reviewed literature, it can be said that there is insufficient research on the specific barriers hindering the adoption of digital SCM tools in Nigeria. Understanding these barriers, whether they are financial, technical, cultural, or regulatory is critical to develop effective strategies for overcoming them (Choi et al., 2018). Therefore, this study aims to assess the critical challenges affecting supply chain management in the Nigerian construction industry. By using empirical evidence from construction professionals, the research seeks to highlight key problem areas and propose practical recommendations for enhancing supply chain efficiency, reducing waste, and improving coordination among stakeholders.

## 2. METHODOLOGY

The quantitative approach is justified for this study because it aligns with the research objective, which aim to assess the critical challenges in supply chain management in Nigerian construction industry. In the



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quantitative study, questionnaire was used to obtain the necessary information from the participants of the study. The questionnaire was adopted as it allowed the researchers to collect data from a large sample of construction professionals, ensuring that the findings are representative and generalizable (Creswell, 2014). The targeted study population composed of registered construction firms in Abuja Nigeria that are directly involved in or have knowledge about SCM. The sample frame for the study was purposive as it consists of only firms that their professionals were willing to take part in the survey exercise. In line with this, 15 registered firms that have adequate experience in SCM were willing to participate in the study. The professionals in the firms include builders, quantity surveyors, architects, civil engineers, project managers, and other stakeholders that play a role in the procurement, delivery, and management of construction materials and resources. The adopted sampling frame ensures that the study covers a wide range of professionals with varying levels of experience and expertise in SCM. Hence, 10 construction professionals were randomly selected from each of the 15 firms for the survey study. This implies that 150 construction professionals from the 15 study firms participated in the survey study. Data was collected through the distribution of questionnaires to the selected participants. The questionnaire was designed on a five-point Likert's scale format with two main distinct sections. The first section addressed the profile of the study respondents, while the second section was based on the various challenges experience in SCM in Nigerian construction industry. The questionnaires were distributed electronically via email and online survey platforms to ensure convenience and accessibility for the participants. Follow-up reminders were sent to encourage participation and to improve the response rate. The data collection process was conducted over a period of six weeks to allow sufficient time for participants to complete the questionnaires. The collected data was analyzed using statistical tools, such as SPSS (Statistical Package for the Social Sciences). Descriptive statistics, such as mean scores and ranking were used to summarize the data and identify trends.

## 3. RESULTS AND DISCUSSION

### *3.1 Respondent Demography*

The result of the respondent's role jobs distribution is presented in Figure 1

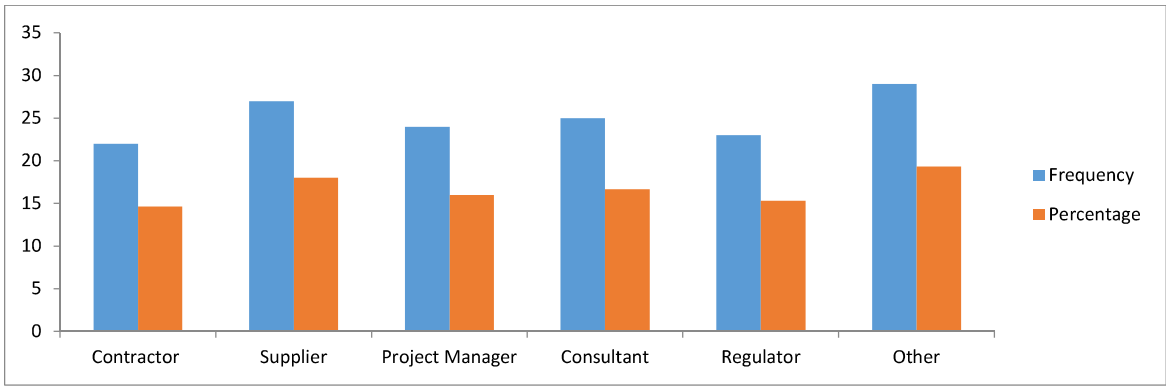


Figure 1: Job role Distribution

As shown in the table, the diversity of job roles indicates a balanced representation of key stakeholders in the construction supply chain. Notably, Suppliers (18%) and Consultants (17%) form a significant portion, suggesting that perspectives on material sourcing and professional advisory services are well captured. Contractors and Project Managers (16%) provide insight into the operational and managerial aspects of supply chain processes.

Also, Regulators (15%) are crucial in understanding policy and compliance aspects that influence technology adoption. The 'Other' category (19%) could include emerging roles such as digital transformation officers, IT specialists, or logistics managers, highlighting a growing multidisciplinary in the sector. The above result shows the representation of respondents is well distributed across the key roles in the construction supply chain.

### 3.2 *Challenges of Supply Chain Management in Nigerian Construction Industry*

Table 1 presents the current state analysis of Nigerian SCM based on field survey data collected, highlighting critical areas requiring immediate attention and digital intervention.

Delay in material delivery emerges as the most severe challenge facing the Nigerian construction industry with a mean item score of 4.2 (SD = 0.8), indicating that this problem occurs frequently across most projects. This finding strongly corroborates earlier studies by Akinradewo et al. (2021) that identified material procurement and delivery as the primary cause of project delays in Nigerian construction, contributing to cost overruns of up to 40% in major infrastructure projects. The consistently high scores (minimum of 3.0) across all respondents suggest that delivery delays are a systemic issue rather than isolated incidents, supporting the observations of Oke et al. (2018) that inadequate logistics



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infrastructure and poor supplier relationships are endemic in the sector. Poor stakeholder coordination ranks as the second most critical issue (Mean = 4.1, SD = 0.9) reflecting the fragmented nature of construction project management in Nigeria.

TABLE 1 DESCRIPTIVE STATISTICS (SCM PRACTICES)

| SCM challenges | Mean | SD | Min | Max | Performance Level |
|---|---|---|---|---|---|
| Delay in Materials Delivery | 4.2 | 0.8 | 3 | 5 | Very High Problem |
| Poor Stakeholder Coordination | 4.1 | 0.9 | 2.5 | 5 | Very High Problem |
| Lack of Transparency | 3.9 | 1 | 2 | 5 | High Problem |
| Fragmented Communication | 3.8 | 0.9 | 2.5 | 5 | High Problem |
| Supplier Collaboration | 2.3 | 0.8 | 1 | 4 | Poor Performance |
| Inventory Management | 2.4 | 0.9 | 1 | 4.5 | Poor Performance |
| Demand Forecasting | 2.5 | 1 | 1 | 4 | Poor Performance |
| Risk Management | 2.6 | 0.9 | 1.5 | 4.5 | Poor Performance |

Field Survey (2025)

This finding aligns with Adebowale *et al.* (2022), Wang *et al.* (2020) that observed that absence of integrated project management systems can lead to poor information flow among contractors, suppliers, and clients. The high standard deviation (0.9) suggests varying experiences across different project types and organizational sizes, which supports Ogunbiyi *et al.* (2014) that pointed out that larger construction firms tend to have better coordination mechanisms than smaller local contractors. Lack of transparency (Mean = 3.9, SD = 1.0) and fragmented communication (Mean = 3.8, SD = 0.9) represent interconnected challenges that significantly impact SCM efficiency. These findings validate the work of Aghimien *et al.* (2020) that identified poor information sharing and communication gaps as major barriers to effective supply chain integration in African construction markets. The wider range of responses for transparency issues (Min = 2.0, Max = 5.0) indicates significant variation in organizational practices, suggesting that while some companies have implemented transparency measures, many still operate with limited visibility across their supply chains.

The analysis reveals consistently poor performance across critical SCM functions, with all core practice areas scoring below the midpoint of 3.0 on the performance scale. Supplier collaboration shows the weakest performance (Mean = 2.3, SD = 0.8), indicating that most organizations maintain transactional rather than strategic relationships with their suppliers. This finding supports Durdyev *et al.* (2018) observed that Nigerian construction firms often lack formal supplier development programs and partnership strategies, leading to adversarial rather than collaborative relationships that could enhance SCM performance. Inventory management performance (Mean = 2.4, SD = 0.9) reflects inadequate stock control systems and poor material planning capabilities. The low performance scores align with Ogunde *et al.* (2017) that affirmed that most Nigerian construction firms rely on manual inventory tracking systems, leading to frequent stockouts, overstocking, and increased carrying costs. The relatively wide performance range (Min = 1.0, Max = 4.5) suggests that while some organizations have invested in improved inventory systems, the majority still struggle with basic stock management practices. Demand forecasting capabilities (Mean = 2.5, SD = 1.0) represent a critical weakness that underlies many of the delivery and coordination problems identified. This poor performance corroborates the findings of (Dubey et al., 2018) that argued that Nigerian contractors typically lack sophisticated planning tools and rely heavily on experience-based estimates rather than data-driven forecasting methods. The wide standard deviation indicates significant variation in forecasting capabilities, likely reflecting differences in organizational size, project complexity, and technology adoption levels. Risk management practices (Mean = 2.6, SD = 0.9) show marginally better performance but remain below acceptable standards for effective SCM. This finding aligns with (Kshetri, 2018) that observed that while Nigerian construction firms acknowledge the importance of risk management, most lack formal risk assessment strategies and contingency planning procedures. The limited range of maximum scores (Max = 4.5) suggests that even the best-performing organizations have significant room for improvement in proactive risk management. The consistently poor performance across core SCM functions, combined with severe operational challenges, creates a compelling case for digital technology intervention. The high severity of communication and coordination problems directly supports the earlier finding that cloud computing and IoT technologies are perceived as the most important digital solutions for the sector. These performance gap is in line with the technology priorities identified by respondents, suggesting a clear understanding of the relationship between current deficiencies and potential digital solutions.

## 4. CONCLUSION

Premised on the empirical data, statistical analysis, and strategic interpretation, the research concludes that Nigerian construction SCM exhibits severe performance deficiencies across core functions, with universal material delivery delays and coordination failures indicating structural industry-wide problems. In other words, based on the information obtained from construction professionals in Abuja, the study provides a clear, ranked list of SCM challenges in Nigerian construction industry. The study recommends that the Nigerian construction industry should prioritize improving logistics planning/supplier relationships to address delivery delays problem, develop frameworks for



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better stakeholder coordination/transparency and use the developed frameworks to design and test specific interventions such as IoT / cloud computing digital tools and process reforms that are tailored to the identified challenges.

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