

Supply Chain Management And Operational Efficiency In Logistics Companies: A Case Of DHL Uganda

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Abstract

This study examined the relationship between supply chain management (SCM) practices and operational efficiency in logistics companies, with specific reference to DHL Uganda. The research was guided by three objectives: to assess the effect of inventory management on operational efficiency, to evaluate the influence of supplier relationship management on operational efficiency, and to examine the role of information technology integration in enhancing operational efficiency at DHL Uganda. A cross-sectional survey design was employed, and data were collected from 178 respondents comprising supply chain officers, operations managers, warehouse staff, and IT personnel at DHL Uganda. Results of descriptive analysis indicated moderate-to-high levels of SCM practice implementation across inventory management (mean = 3.78, SD = 0.71), supplier relationship management (mean = 3.52, SD = 0.84), and IT integration (mean = 4.01, SD = 0.66). Pearson correlation analysis confirmed significant positive relationships between all SCM variables and operational efficiency. Multiple regression analysis revealed that the three SCM dimensions collectively accounted for 74.2% of variance in operational efficiency ($R^2 = 0.742$), with IT integration as the strongest predictor ($\beta = 0.389$). The study concludes that robust SCM practices are critical to operational excellence in logistics and recommends enhanced IT infrastructure investment, supplier partnership development, and real-time inventory management systems.

Keywords: Supply chain management, operational efficiency, inventory management, supplier relationship management, IT integration, DHL Uganda, logistics.

1.0 BACKGROUND

The logistics industry occupies a pivotal position in the global economy, serving as the connective tissue that links producers, distributors, and consumers across geographically dispersed markets (Julius, 2024). Effective supply chain management (SCM) is recognized as a fundamental source of competitive advantage in this sector, enabling firms to reduce costs, improve service levels, and respond agilely to dynamic market demands (Paul & Kazaara, 2023). In the African context, logistics companies face a unique and complex operating environment characterized by inadequate infrastructure, regulatory heterogeneity, currency volatility, and skills gaps that simultaneously constrain operational efficiency and amplify the importance of robust SCM practices (Kazaara & Audrey, 2024).

DHL Uganda, operating as part of DHL Express's Sub-Saharan Africa network, is one of the leading international logistics and courier companies in Uganda. The company provides express delivery, freight transportation, and supply chain solutions to a diverse clientele spanning banking, manufacturing, healthcare, and fast-moving consumer goods sectors. Uganda's strategic position as a landlocked country at the crossroads of East and Central Africa renders efficient logistics operations particularly critical for the country's economic integration and trade facilitation objectives (Kazaara & Audrey, 2024). In recent years, DHL Uganda has invested significantly in technological

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upgrades, including the deployment of enterprise resource planning (ERP) systems and real-time tracking platforms, yet questions remain about the extent to which these investments have translated into measurable improvements in operational efficiency (Julius & Nancy, 2026).

Globally, the literature on SCM and operational efficiency has grown substantially since the foundational contributions of Bowersox and Closs (1996), who conceptualized logistics as an integrated system of activities designed to achieve efficient movement and storage of goods. Contemporary scholarship has increasingly emphasized the role of digital technologies including Internet of Things (IoT), blockchain, and big data analytics in transforming logistics operations (Julius & Kazaara, 2026a). However, much of this literature is anchored in the experiences of high-income countries, and the specific dynamics of SCM-efficiency relationships in sub-Saharan African logistics companies remain relatively underexplored (Caroline et al., 2026). This study contributes to filling this gap by empirically examining these relationships within the operational context of DHL Uganda.

2.0 PROBLEM STATEMENT

Despite significant investments in supply chain infrastructure and technology by DHL Uganda, operational inefficiencies persist in the form of delayed shipments, inventory discrepancies, supplier coordination failures, and suboptimal last-mile delivery performance (Julius, 2024). These inefficiencies translate into elevated operational costs, customer dissatisfaction, and reputational risk (Julius & Audrey, 2025). Previous research in the Ugandan logistics sector has been predominantly descriptive, lacking the empirical rigor needed to quantify the specific contributions of inventory management, supplier relationship management, and IT integration to operational efficiency (Winny et al., 2023). This study therefore sought to provide a statistically robust analysis of the SCM-efficiency nexus at DHL Uganda, with a view to generating actionable insights for logistics management practice.

3.0 MAIN OBJECTIVE

The main objective of this study was to examine the relationship between supply chain management practices and operational efficiency at DHL Uganda. Specific objectives included: (i) to assess the effect of inventory management on operational efficiency at DHL Uganda; (ii) to evaluate the influence of supplier relationship management on operational efficiency at DHL Uganda; and (iii) to examine the role of information technology integration in enhancing operational efficiency at DHL Uganda.

4.0 LITERATURE REVIEW

This study is theoretically anchored in the Resource-Based View (RBV) of the firm (Barney, 1991), which contends that firms achieve and sustain competitive advantage by developing and deploying resources that are valuable, rare, inimitable, and non-substitutable (VRIN). Applied to logistics, the RBV implies that SCM capabilities including sophisticated inventory systems, strong supplier networks, and advanced IT platforms constitute strategic resources that can drive superior operational performance (Julius & Kazaara, 2026c). Complementing the RBV, Transaction Cost Theory (Williamson, 1985) provides a framework for understanding the efficiency implications of supplier relationship management, predicting that firms that invest in long-term, trust-based supplier partnerships will incur

lower transaction costs and achieve greater operational efficiency than those relying on adversarial, arm's-length market relationships(Moses et al., 2025).

Empirically, Chopra and Meindl (2016) demonstrated that companies implementing demand-driven inventory management systems characterized by real-time demand sensing, safety stock optimization, and collaborative replenishment achieved inventory holding cost reductions of 15-30% compared to firms using traditional forecast-based approaches(Florence & Julius, 2023). In the African logistics context, Bello and Danjuma (2020) studied Nigerian logistics firms and found that technology adoption was the single most important predictor of operational efficiency, explaining 52% of variance in efficiency outcomes. Regarding supplier relationship management, Nyaga, Whipple, and Lynch (2010) established that information sharing and collaborative joint planning between logistics providers and suppliers significantly reduced order cycle times and improved on-time delivery rates(Julius, 2024). A study of East African logistics companies by Muhumuza (2021) found that firms with structured supplier development programs and regular performance review mechanisms achieved 34% higher operational efficiency scores compared to firms without such programs.

5.0 METHODOLOGY

This study employed a cross-sectional survey design, appropriate for capturing data from multiple respondent groups at a single point in time. The study was conducted at DHL Uganda's operations in Kampala, including the main hub at Entebbe International Airport, the Kampala Service Center, and satellite stations in Mbarara and Gulu(Sarah et al., 2024). The target population comprised all 213 employees in supply chain, operations, warehouse, and IT functions. Using Slovin's formula with a 5% margin of error, a sample of 139 respondents was obtained; however, to improve statistical power, questionnaires were administered to all 213 employees, of whom 178 returned usable responses (response rate = 83.6%)(Nafiu, 2012). Data collection instruments included a structured questionnaire with Likert-scale items validated through expert review and pilot testing (Cronbach's alpha: inventory management $\alpha = 0.82$; supplier relationship management $\alpha = 0.79$; IT integration $\alpha = 0.87$; operational efficiency $\alpha = 0.84$). Data were analyzed using SPSS version 25 through descriptive statistics, Pearson correlation, and multiple regression analysis(Nelson et al., 2022).

6.0 RESULTS

6.1 Descriptive Statistics

Table 1 displays the descriptive statistics for the study variables. Information technology integration recorded the highest mean score of 4.01 (SD = 0.66), reflecting DHL Uganda's relatively advanced IT infrastructure compared to local logistics competitors. Respondents specifically acknowledged the utility of the DHL Express MyDHL+ digital platform, real-time shipment tracking, and ERP-based warehouse management systems as significant operational enablers. Inventory management recorded a mean of 3.78 (SD = 0.71), with respondents rating demand forecasting accuracy and safety stock management as strong areas, while expressing concerns about inventory reconciliation delays and periodic system downtime affecting stock accuracy. Supplier relationship management recorded a mean of

3.52 (SD = 0.84), the lowest among SCM variables, reflecting acknowledged weaknesses in supplier performance monitoring, inconsistent supplier communication, and limited joint business planning with key vendors. Operational efficiency, measured across dimensions of cost efficiency, time efficiency, and service quality, recorded an overall mean of 3.69 (SD = 0.78), indicating above-average but improvable operational performance.

Table 1: Descriptive Statistics (N = 178)

Variable	N	Mean	Std. Dev.	Min	Max
Inventory Management	178	3.78	0.71	1.00	5.00
Supplier Relationship Mgmt	178	3.52	0.84	1.00	5.00
IT Integration	178	4.01	0.66	1.00	5.00
Operational Efficiency	178	3.69	0.78	1.00	5.00

Source: Primary Data, 2025

6.2 Correlation Analysis

The Pearson correlation results in Table 2 reveal significant positive associations between all SCM variables and operational efficiency. IT integration demonstrated the strongest correlation with operational efficiency ($r = 0.738$, $p < 0.01$), confirming the critical role of digital technologies in logistics performance. Inventory management showed a strong positive correlation ($r = 0.681$, $p < 0.01$), consistent with the theoretical prediction that efficient inventory management reduces operational waste and improves throughput. Supplier relationship management, while recording the weakest correlation among the three predictors ($r = 0.612$, $p < 0.01$), nonetheless demonstrated a strong and significant association with operational efficiency, underscoring the importance of collaborative supplier partnerships for supply chain performance. Inter-correlations among predictor variables were moderate (r range: 0.44–0.58), confirming the absence of multicollinearity.

Table 2: Pearson Correlation Matrix | ** $p < 0.01$ (2-tailed)

Variable	Inventory Mgmt	Supplier Rel. Mgmt	IT Integration	Op. Efficiency
Inventory Management	1.000			
Supplier Rel. Mgmt	0.445**	1.000		
IT Integration	0.578**	0.498**	1.000	
Operational Efficiency	0.681**	0.612**	0.738**	1.000

Source: Primary Data, 2025

6.3 Regression Analysis

Multiple linear regression analysis was performed to determine the combined and individual predictive effects of SCM variables on operational efficiency. Regression assumptions were verified prior to analysis; the Durbin-Watson statistic of 1.89 confirmed independence of residuals, and Variance Inflation Factors (VIF) ranged from 1.32 to 1.78, well below the threshold of 10, confirming no multicollinearity (Nelson et al., 2023). The overall regression model

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was highly significant ($F(3, 174) = 167.82, p < 0.001$), with $R^2 = 0.742$ indicating that the three SCM dimensions explained 74.2% of the variance in operational efficiency at DHL Uganda. The adjusted R^2 of 0.737 confirmed the model's explanatory robustness(Christopher et al., 2024). IT integration emerged as the strongest individual predictor of operational efficiency ($\beta = 0.389, t = 9.21, p < 0.001$), followed by inventory management ($\beta = 0.321, t = 7.84, p < 0.001$), and supplier relationship management ($\beta = 0.218, t = 5.67, p < 0.001$). All coefficients were positive and statistically significant, confirming the constructive role of all three SCM dimensions in driving operational efficiency.

Table 3: Regression Coefficients

Predictor Variable	B	Std. Error	β	t	p-value
(Constant)	0.421	0.198		2.127	0.035
Inventory Management	0.334	0.043	0.321	7.84	< .001
Supplier Relationship Mgmt	0.228	0.040	0.218	5.67	< .001
IT Integration	0.421	0.046	0.389	9.21	< .001

Source: Primary Data, 2025

7.0 DISCUSSION

The results of this study strongly support the proposition that SCM practices are critical drivers of operational efficiency in logistics companies. The dominant effect of IT integration ($\beta = 0.389$) validates the RBV's assertion that technology-based capabilities constitute strategic assets in logistics, and corroborates Bello and Danjuma's (2020) finding that technology adoption is the primary efficiency driver in African logistics firms. DHL Uganda's investment in digital platforms has clearly yielded efficiency dividends, though the persistence of operational challenges particularly around system downtime and data integration suggests that the full potential of existing IT assets has not been realized(Julius & Kazaara, 2026b). The contribution of inventory management ($\beta = 0.321$) affirms Chopra and Meindl's (2016) theoretical predictions and highlights the operational and financial significance of demand-driven inventory approaches. The comparatively lower but still significant effect of supplier relationship management ($\beta = 0.218$) reflects both the structural importance of supplier partnerships in logistics and the current underdevelopment of supplier collaboration practices at DHL Uganda, representing the area with the greatest improvement potential(Musaibah et al., 2023).

8.0 CONCLUSIONS AND RECOMMENDATIONS

This study concludes that supply chain management practices—specifically inventory management, supplier relationship management, and IT integration—collectively and individually exert significant positive effects on operational efficiency at DHL Uganda, explaining 74.2% of variance in operational efficiency outcomes. The study recommends that DHL Uganda prioritize investment in next-generation IT systems, including AI-powered demand forecasting, IoT-enabled shipment tracking, and blockchain-based supply chain transparency tools, to build on its existing technology advantage. A structured Supplier Partnership Program should be established, incorporating regular joint planning sessions, transparent performance dashboards, collaborative issue resolution processes, and long-term

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framework agreements with strategic suppliers. Additionally, a real-time inventory management system integrating demand signals from key clients should be deployed to minimize stock discrepancies and reduce order cycle times.

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