

Impact of Digital Platforms on Supply Chain Efficiency of Jumia Nigeria

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ABSTRACT

This study assessed the effect of digital platforms on Supply Chain Efficiency (SCE) at Jumia Nigeria, focusing on three key independent variables: Logistics and Service Delivery (LSD), E-payment System (EPS), and Integrated Warehousing (ITW). A cross-sectional research design was adopted, with data collected from 186 staff members across key digital and supply chain operations (Supply Chain Managers & Logistics Partners, E-commerce Operations & IT Specialists, and Warehouse Staff) at Jumia Nigeria's Lagos facilities, using a structured questionnaire administered via Google Forms. Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 3 was employed for data analysis. Results showed that Integrated Warehousing exerted the strongest positive effect on SCE ($\beta = 0.698$, $t = 62.079$, $p = 0.000$), followed by E-payment System ($\beta = 0.286$, $t = 38.311$, $p = 0.000$). Logistics and Service Delivery had a positive but non-significant influence ($\beta = 0.022$, $t = 2.260$, $p = 0.052$). The model explained 99.5% of variance in SCE ($R^2 = 0.995$), measured via order-fulfillment speed, inventory turnover ratio, and delivery satisfaction. These results indicated that the strategic deployment of digital platforms across logistics, finance, and storage functions is a critical driver of enhanced supply chain performance at Jumia Nigeria. This study recommends prioritizing investment in advanced digital logistics technologies to boost order fulfillment speed, optimizing e-payment integration for faster financial flows and stock replenishment, and expanding the use of Warehouse Management Systems (WMS) to improve inventory turnover and accuracy.

Keywords: Digital Platforms, Supply Chain Efficiency, Logistics and Service Delivery, E-payment System, Integrated Warehousing.

INTRODUCTION

In the e-commerce sector, supply chain efficiency is pivotal for competitive advantage, balancing speed, cost, and customer satisfaction in a digital-first environment (Ivanov, 2020). Digital platforms enable seamless integration of logistics, payments, and inventory, driving operational excellence in platforms like Jumia Nigeria (Ma & Jaafar, 2025). Effective supply chain management ensures rapid order fulfillment, optimized inventory turnover, and high delivery satisfaction, critical for customer retention in Nigeria's growing online market (Ijirshar et al., 2023). The rise of digital platforms has facilitated real-time data exchange, automation, and decision-making, significantly improving supply chain efficiency (Büyüközkan & Göçer, 2018).

In Africa, e-commerce has seen significant growth in recent years, driven by the adoption of digital platforms, which have revolutionized supply chain practices. According to Ijirshar et al. (2023), digital platforms like Jumia Nigeria have integrated logistics, payment systems, and warehousing functions, optimizing the flow of goods and enhancing operational effectiveness. Jumia, as one of Africa's largest e-commerce platforms, has leveraged these digital tools to improve supply chain efficiency, reduce delivery times, and meet the increasing demands of customers. However, despite these advancements, the challenges faced by e-commerce platforms in Africa such as infrastructural limitations, regulatory hurdles, and the need for continuous technological upgrades remain significant (Owuso & Jaja, 2022; Ayaga & Nyagba, 2022).

In the Nigerian context, Jumia Nigeria, as a key player in the local e-commerce market, has made strides in integrating logistics, e-payment, and warehousing systems to optimize its supply chain. The company's supply

chain operations rely heavily on digital platforms to manage and streamline processes, such as order fulfillment, payment processing, and inventory management. However, challenges persist in ensuring consistent and efficient delivery, customer satisfaction, and stock management across a wide geographical area (Mustapha & Adanla, 2022; Agbeche et al., 2025). These challenges underscored the importance of assessing the impact of digital platforms on Jumia Nigeria's supply chain efficiency, focusing on key variables such as logistics, service delivery, e-payment systems, and integrated warehousing.

Digital platforms represent a transformative approach that aligns technology with supply chain goals to enhance responsiveness and reduce waste (Büyüközkan & Göçer, 2018). For instance, logistics and service delivery, powered by real-time tracking and automation, minimize delays and improve delivery reliability (Rigin & Mohanraj, 2025). E-payment systems accelerate financial flows, reducing transaction delays and enhancing inventory replenishment (Owuso & Jaja, 2022). Integrated warehousing, through WMS and IoT, optimizes storage and picking, boosting turnover and accuracy (Tonwe & Kingsley-Omoyibo, 2025).

The core problem of this study is the lack of specific, localized empirical evidence quantifying the differential impact of key digital platform components on the multifaceted Supply Chain Efficiency of Jumia Nigeria. While global and regional literature confirms the theoretical link between digital enablers and operational performance, Jumia Nigeria operates under unique logistical constraints, market dynamics, and consumer expectations within the Nigerian landscape. Specifically, previous studies have either focused broadly on logistics (e.g., Mustapha & Adanla, 2022), concentrated on a single digital aspect like e-payments in SMEs (e.g., Hitlar et al., 2025), or examined a broader firm performance rather than granular supply chain efficiency metrics like Order Fulfillment Speed and Inventory Turnover Ratio.

The reason for doing this research is twofold: First, to provide Jumia Nigeria's management with a statistically validated breakdown of which digital platform functions (Logistics/Delivery, E-payment, or Integrated Warehousing) exert the most significant influence on its key efficiency outcomes (speed, turnover, and customer satisfaction). This evidence is crucial for strategic resource allocation, directing investment toward the components yielding the highest return on efficiency. Second, this study aims to contribute to the body of knowledge by offering a contemporary, platform-specific analysis within the Nigerian e-commerce sector, thereby enhancing the generalizability and practical applicability of digital supply chain theories in emerging markets. Without this focused assessment, Jumia risks suboptimal operational spending and continued performance gaps in meeting customer delivery expectations.

The specific objectives of this study are:

- i. To examine the effect of Logistics and Service Delivery on Supply Chain Efficiency at Jumia Nigeria.
- ii. To evaluate the effect of E-payment System on Supply Chain Efficiency at Jumia Nigeria.
- iii. To assess the effect of Integrated Warehousing on Supply Chain Efficiency at Jumia Nigeria.

In alignment with the stated objectives, this study seeks to test the following null hypotheses:

H₀₁: Logistics and Service Delivery does not significantly affect Supply Chain Efficiency at Jumia Nigeria.

H₀₂: E-payment System does not significantly affect Supply Chain Efficiency at Jumia Nigeria.

H₀₃: Integrated Warehousing does not significantly affect Supply Chain Efficiency at Jumia Nigeria.

LITERATURE REVIEW

Conceptual Review Explanations

Supply Chain Efficiency

Supply chain efficiency represents the capability of an organization to optimize operations, minimizing costs and resources while maximizing responsiveness to consumer demand. Wang et al. (2022) defined this concept as optimizing processes to reduce costs, enhance production quality, and meet customer demands through streamlined capital, information, and logistics flows. In a related definition, Ma and Jaafar (2025) defined supply

chain efficiency as the ability to optimize resource allocation, enhance coordination, and improve responsiveness across supply chain processes. Furthermore, Christopher (2016) described efficiency as the effective management of resources to minimize waste and cost in the process of moving goods from suppliers to end-users.

Supply chain efficiency emerges as the synchronized optimization of procurement, inventory control, distribution logistics, and information exchange to minimize resource consumption and cycle times while maximizing customer value delivery (Juhara, S. (2024; Anaba et al., 2024). This efficiency is further characterized by the seamless, rapid, and accurate flow of goods coupled with cost containment and superior service standards (Ivanov, 2020; Ma & Jaafar, 2025). In the context of Jumia Nigeria, digital platforms are believed to drive this efficiency by enabling real-time data exchange, which facilitates quicker decision-making and better flow management.

In this study, Supply Chain Efficiency of Jumia Nigeria is measured using three key metrics: Order Fulfillment Speed (average time from order to delivery), which is a direct measure of speed and responsiveness (Ivanov, 2020); Inventory Turnover Ratio (ratio of cost of goods sold to average inventory), which reflects operational optimization and waste reduction (Ma & Jaafar, 2025; He et al., 2024); and Customer Satisfaction with Delivery (on-time deliveries and feedback scores), which captures the ultimate success of the supply chain in meeting consumer needs (Holloway, 2024; Al-Madi, 2017). These metrics assess the overall impact of digital platforms on both operational effectiveness and the final customer experience.

Digital Platforms

Digital platforms are technology-enabled systems that facilitate interactions, data sharing, and process integration among supply chain partners, enhancing efficiency. Büyüközkan and Göçer (2018) stated that they are intelligent, data-driven networks enabling real-time processing, collaboration, and asset optimization in supply chains. Additionally, Núñez-Merino et al. (2020) assert that digital platforms are web applications, mobile apps, and APIs that enable real-time data exchange, order processing, and stakeholder coordination. Ma and Jaafar (2025) defined digital platforms, as a core element of digital transformation, as systems that drive supply chain efficiency by enabling end-to-end transparency and data-driven decision-making.

This connectivity enables real-time data sharing and process automation, which is explained as enhancing visibility and coordination (Ivanov, 2020; Lee & Kao, 2021). For Jumia Nigeria, this concept is relevant because these platforms streamline operations, leading to faster order fulfillment and higher inventory turnover by reducing manual interventions and optimizing flows. They are defined by their ability to manage information flow, using technologies like e-payment systems and real-time tracking to improve efficiency and customer delivery satisfaction (Ijirshar et al., 2023).

Logistics and Service Delivery

Logistics and service delivery are integral components of supply chain efficiency, particularly in e-commerce platforms like Jumia Nigeria. Logistics management refers to the planning, implementation, and control of the movement of goods, resources, and information from the point of origin to consumption (Dannoun, 2022). According to Mustapha and Adanla (2022), logistics management ensures the efficient acquisition, storage, and shipment of resources, which directly influences customer satisfaction through timely deliveries and competitive delivery charges. Ijirshar et al. (2023) described transport logistics as a key driver of market share expansion, highlighting services such as door-to-door delivery and outsourcing, which improve reliability but may not always reduce costs in operations like Jumia's. In line with this, Agbeche et al. (2025) emphasized the importance of delivery speed, reliability, and accuracy in order fulfillment for customer satisfaction. Effective service delivery, thus, is characterized by how swiftly and reliably goods are delivered to customers, as seen in global practices like DHL's consistency in meeting delivery times, which supports efficient supply chain performance (Agbeche et al., 2025).

Furthermore, Rigin and Mohanraj (2025) defined e-logistics as the application of digital technologies such as IoT, EDI, and RFID to streamline logistics processes, enhance efficiency, and improve tracking and inventory

management. By automating tasks and providing real-time visibility, e-logistics helps businesses like Amazon optimize their operations, minimize costs, and reduce overstocking, ultimately enhancing supply chain performance and customer service (Rigin & Mohanraj, 2025). This approach, implemented in Jumia's operations, aligns digital platforms with logistics to boost operational efficiency and customer satisfaction.

E-payment System

E-payment systems are essential digital tools facilitating rapid, secure financial flows and transaction efficiency within the modern supply chain. E-payment is defined by Owuso and Jaja (2022) as the electronic transfer of value from a payer to a recipient via digital mechanisms, allowing for remote account management and seamless e-commerce transactions. Expanding on this, it is also defined as an electronic payment system used to conduct transactions with digital methods without the need for physical cash (Solomon, 2018). Furthermore, e-payment services are described by Kilay et al. (2022) as encompassing various digital payment technologies, including cards, e-wallets, and electronic fund transfers, which improve transaction accuracy and security.

An e-payment system is an integrated suite of financial tools and technologies that digitizes the monetary exchange process across the supply chain. For Jumia Nigeria, this concept is highly relevant as these systems enhance efficiency by accelerating financial flows (Novianti & Baihaqi, 2025). The adoption of e-payments, such as mobile and web transactions, streamlines the entire procurement and sales cycle by reducing reliance on physical cash, which minimizes delays and operational errors (Adebayo, 2022). This efficiency boost positively affects key supply chain metrics like order fulfillment speed and inventory turnover, as quicker payment settlements enable faster release of goods and replenishment of stock. Moreover, secure digital transactions foster consumer confidence, which is described as enhancing buying frequency and reducing cart abandonment, thus ensuring stable demand for Jumia's logistics operations (Ayaga & Nyagba, 2022).

Integrated Warehousing

Integrated warehousing represents the coordinated management of all activities related to storing and moving goods to optimize the supply chain flow. Guliti et al. (2019) define integrated warehousing as coordinated systems for receiving, storing, issuing, and safeguarding inventory to minimize costs and disruptions. In a similar vein, Kibrom (2019) described it as the set of activities involving the systematic and orderly storage of goods on a large scale, encompassing receiving, put-away, storage, picking, and shipping processes. Additionally, Tonwe and Kingsley-Omoyibo (2025) focus on the technological aspect, describing it via the Warehouse Management System (WMS), a software application that supports and optimizes operations through real-time tracking of inventory, storage locations, and order fulfillment.

Integrated warehousing ensures a systematic approach that utilizes digital platforms, like WMS, to achieve seamless coordination of facility layout, inventory, and material handling across the storage lifecycle (Bhatia & Shah, 2024). This integration is described as transforming the warehouse from a simple storage location into a dynamic hub that enhances order fulfillment speed and inventory turnover (Otte, 2025). For Jumia Nigeria, digital platforms connect warehouse functions such as real-time tracking of items via digital tools with external supply chain partners, which ensures that goods are stored, retrieved, and dispatched efficiently, minimizing lead times and errors. This systematic approach is also described as being essential for improving space utilization and inventory accuracy, directly impacting Jumia's ability to meet delivery promises and manage operational costs effectively (Patel, 2023).

Empirical Review

Logistics & Service Delivery and Supply Chain Efficiency

Ibrahim and Jiddah (2025) examined unlocking e-commerce growth in Nigeria the strategic impact of logistics on Jumia online shopping performance in Abuja. The study investigated the effect of order processing on Jumia's performance and determined the effect of information flow on Jumia's performance, with performance measured through customer satisfaction and repeat purchases. A survey research design was adopted, targeting the entire population of 187 Jumia employees in Abuja using census sampling; data were collected via structured questionnaires on a 5-point Likert scale and analyzed with partial least squares structural equation modeling

(PLS-SEM). Findings revealed that order processing exerted a significant positive effect ($\beta = 0.427$, $p < 0.001$) while information flow showed a significant negative effect ($\beta = -0.312$, $p = 0.001$) on performance, explaining 38.7% of variance ($R^2 = 0.387$). Recommendations included advanced order management systems, warehouse optimization, staff training, and information filtering mechanisms. The strength lies in its census approach eliminating sampling bias and context-specific focus on Abuja's e-commerce logistics. However, the moderate R^2 suggests unexamined variables like digital payment systems or integrated warehousing may influence efficiency, limiting generalizability beyond Jumia Abuja.

Mustapha and Adanla (2022) evaluated the effect of logistics management on e-business performance in Ilorin metropolis through delivery charges and pick-up and delivery times of goods; the study used delivery charges and pick-up and delivery times as independent variables and sales volume as the dependent variable, adopted descriptive survey design, targeted an infinite population of Jumia customers in Ilorin, applied Rose et al.'s (2015) formula for a minimum sample size of 400, employed purposive sampling, collected data via close-ended questionnaire, and analyzed responses using frequency counts, descriptive statistics, and t-test at 0.05 significance level, found that logistics management explained over 57% of sales volume variation ($R^2 = .571$, $F = 131.591$, $p < .000$), with delivery charges ($\beta = .367$, $t = 2.603$, $p = .005$) and pick-up and delivery times ($\beta = .179$, $t = 3.978$, $p = .002$) showing significant positive effects, recommended that e-business brands develop own delivery tools or negotiate with 3PL on customers' behalf to reduce charges and waiting times, and its strength lay in high response rate (95.75%) and reliable Cronbach's alpha values (.708–.851), though it was limited to pick-up station users in one city, potentially reducing generalizability to home deliveries or nationwide operations.

Rigin and Mohanraj (2025) explored impact of e-logistics on supply chain management. The study examined effects of e-logistics on supply chain management, differences between traditional logistics and e-logistics, and advantages and disadvantages of e-logistics; variables included visibility (real-time tracking), communication (EDI, IoT), efficiency (automation), cost reduction, transparency, and customer service, with proxies like order fulfillment, inventory management, and disruption handling. The methodology used literature review of prestigious journals on supply chain management and logistics. The population encompassed global e-commerce and logistics practices, without specified sample size, using secondary data collection from reviewed studies. Data analysis involved synthesis of existing knowledge. Findings determined e-logistics enhanced visibility, communication, efficiency, cost reduction, transparency, and customer service through IoT, EDI, RFID, and automation, while reducing errors and manual efforts compared to traditional pen-and-paper processes; challenges included data security, high investment, and infrastructure disparities. Recommendations urged adopting digital tools for scalability despite cybersecurity needs. The strength lay in comprehensive comparative table and global case insights from Amazon, FedEx, UPS. However, critique noted reliance on secondary sources limited empirical validation and Nigeria-specific applicability.

E-payment System and Supply Chain Efficiency

Owuso and Jaja (2022) examined effect of technology on supply chain performance of courier firms in Nigeria: implication for post pandemic era. The study assessed cloud computing, e-payment, and internet of things as predictors, with supply chain performance measured via delivery reliability and lead-time. The cross-sectional survey design targeted 237 courier firms registered with NIPOST, sampled 149 firms using Yamane formula, collected data via questionnaires from managers (104 usable, 70% response), and analyzed using Pearson correlation in SPSS 25.1. Findings revealed strong positive significant relationships (cloud computing-delivery reliability $r = .932$, $p < .01$; cloud computing-lead time $r = .991$, $p < .01$; e-payment-delivery reliability $r = .984$, $p < .01$; e-payment-lead time $r = .953$, $p < .01$; IoT-delivery reliability $r = .953$, $p < .01$; IoT-lead time $r = .943$, $p < .01$). The study recommended continual technology upgrades for reliability and lead time. Strength lies in robust sampling and high correlations validating digital tools in post-pandemic logistics. However, reliance on correlation limits causality inference, and NIPOST-registered focus may exclude informal couriers.

Ayaga and Nyagba (2022) examined mobile e-commerce and the changing consumer behavior in Nigeria. The study investigated mobile e-payment system, mobile e-customer support service, order and delivery, mobile e-advertising, and mobile e-marketing as predictors of consumer behavior. Survey design targeted customers of ten B2C platforms including Jumia Nigeria, purposively sampling 500 respondents with 448 valid questionnaires

collected via five-point Likert scale. Multiple regression via SPSS 23 revealed order and delivery exerted the strongest positive effect ($\beta=.574$, $t=7.256$, $p=.000$), followed by mobile e-marketing ($\beta=.174$, $t=3.178$, $p=.003$), e-customer support ($\beta=.162$, $t=4.111$, $p=.000$), and e-payment ($\beta=.161$, $t=3.224$, $p=.002$); e-advertising was insignificant. Recommendations emphasized trust-building and privacy. Strength included Jumia-specific insights; critique noted outdated 2021 market data and infinite population assumption.

Kilay et al. (2022) assessed the influence of e-payment and e-commerce services on supply chain performance: implications of open innovation and solutions for the digitalization of micro, small, and medium enterprises (MSMES) in Indonesia. The study measured the influence of e-payment services (indicators: awareness, human resources, business resources, technology resources, commitment, governance) and e-commerce services (indicators: success of development, cost saving, communication improvement, marketplace performance, overall satisfaction) on supply chain performance (indicators: agility, adaptability, alignment, long-term relationship, information sharing, process integration), employed multiple linear regression and descriptive analysis, targeted MSMEs in Indonesia with a sample of 164 from seven cities, collected data via online questionnaires using a Likert scale, and found positive significant effects ($R=0.868$, $R^2=0.754$; e-payment $\beta=0.183$, $p=0.022$; e-commerce $\beta=0.726$, $p=0.000$) with low indicators including human resources (46.16%), technology resources (40.53%), and process integration (38.48%), recommended open innovations such as digital literacy training, social media optimization, and SCOR model adoption for efficiency. The strength lies in combining statistical influence measurement with expert-derived practical solutions across diverse regions. However, its focus on small-scale MSMEs limits generalizability to large e-commerce platforms like Jumia, and self-reported data may introduce bias.

Integrated Warehousing and Supply Chain Efficiency

Mwizerwa and Akumuntu (2024) analyzed effect of warehousing management on supply chain performance: a case of Inyange industries ltd. The objective was to analyze the impact of material handling, inventory management, and warehouse capacity planning on supply chain performance. The research employed a quantitative research design, collecting data from a sample size of 105 staff members at Inyange Industries. Data collection was done using questionnaires, and the data analysis utilized SPSS, employing both descriptive and inferential statistics. Findings revealed that material handling, inventory management, and warehouse capacity planning all had significant positive impacts on supply chain performance, with material handling showing the strongest influence (). The study concluded that improvements in warehouse management practices can significantly enhance supply chain efficiency. The strength of the study was its comprehensive approach, incorporating multiple warehouse management dimensions and using a census sampling method for high reliability. However, a critique could be its focus solely on one company, limiting the generalizability of the findings to other industries.

Jantapoon (2025) explored the impact of smart warehousing and last-mile delivery on e-commerce supply chain performance: an empirical study using machine learning-enhanced SEM analysis. The study examined digital transformation (AI/ML implementation, digital twin technology), technology integration (IoT sensors, blockchain system), organizational resources (technical infrastructure, human capital) as independent variables; operational efficiency, customer responsiveness, cost management as mediators; dynamic capabilities, organizational readiness as moderators; and organizational performance, customer satisfaction, competitive advantage as dependent variables. It employed PLS-SEM enhanced with machine learning, targeting 600 e-commerce operators in Thailand using disproportionate stratified sampling (500 small, 60 medium, 40 large), with data collected via online surveys from senior management, IT leaders, and operations managers. Findings showed technology integration had the strongest effect ($\beta = 0.742$, $p < 0.001$) on mediators, all hypotheses supported, with high R^2 (0.779–0.939). It recommended investing in integrated technologies and partnerships. The strength lies in robust ML-enhanced SEM and multi-level respondent design. However, cross-sectional data limited causality, and Thailand-specific context reduced generalizability.

Patel (2023) explored the role of warehouse management in supply chain integration. The objective was to examine warehouse management's role in supply chain integration, focusing on proxies for efficiency: warehouse layout optimization, handling of fast-moving consumer goods (FMCG) items, and operation cycle time, with supply chain performance as the outcome. The research employed a survey methodology, targeting a

sample size of 50 warehouses in Ahmedabad Vatva GIDC. Data collection was accomplished via personal interviews, questionnaires, and telephone follow-ups, and the data analysis used descriptive statistics and pie charts. Findings revealed significant efficiency gaps, including 53% dissatisfaction with layout optimization, 67% needing improvements in FMCG handling, and 30% emphasizing dock-to-stock cycle time as critical. The study recommended adopting advanced WMS and optimization techniques. The strength of the study was its reliance on primary data gathered directly from industrial operations. However, a critique could be that the small sample size limits the generalizability of the findings.

THEORETICAL FRAMEWORK

The underpinning theory for this study is the Resource-Based View (RBV), primarily developed by Wernerfelt (1984) and further advocated by Barney (1991, 2001). RBV suggests that a firm's sustained competitive advantage and superior performance, in this context Supply Chain Efficiency (SCE), are fundamentally determined by the unique, valuable, rare, inimitable, and non-substitutable (VRIN/VRIO) resources and capabilities it controls. The theory explains that digital platforms are a bundle of technological resources and organizational capabilities, which, when effectively integrated, can become a strategic resource that enhances supply chain processes.

The effective deployment of Logistics and Service Delivery platforms, E-payment Systems, and Integrated Warehousing capabilities can be suggested to create an inimitable advantage for Jumia Nigeria by improving Order Fulfillment Speed, Inventory Turnover Ratio, and Customer Satisfaction with Delivery (Ivanov, 2020; Ma & Jaafar, 2025). The strength of RBV is that it emphasizes internal, firm-specific resources as the core driver of efficiency, directly linking the unique digital platform investment of Jumia to its performance outcomes, which is also underscored by scholarly views that define digital platforms as a core element of digital transformation driving supply chain efficiency (Büyüközkan & Göçer, 2018; Núñez-Merino et al., 2020).

Conversely, a weakness is that RBV is cautioned for being tautological defining superior resources by superior performance and it is criticized for sometimes neglecting the influence of the external competitive environment and the challenges of resource deployment and imitation (Priem & Butler, 2001). However, scholarly works relating to this study strongly suggest that superior digital capabilities, such as those that enhance real-time tracking, process automation, and seamless financial flows, are vital to achieve high organizational performance in e-commerce logistics (Ijirshar et al., 2023; Owuso & Jaja, 2022). This theory underpins the study because the digital platforms encompassing efficient logistics management, streamlined e-payment, and optimized warehousing represent valuable technological resources that are crucial for achieving the dependent variable, SCE, thereby offering a strategic explanation for Jumia's ability to maintain high operational performance metrics (Adesina et al., 2025; Tonwe & Kingsley-Omoyibo, 2025).

METHODOLOGY

This study adopted a cross-sectional research design to examine the impact of digital platforms on supply chain efficiency of Jumia Nigeria. This design is suitable because it enables the collection of data at a single point in time, capturing the relationship between digital platform components and supply chain efficiency in a cost-effective manner. It is also appropriate for descriptive and correlational analysis, as it provides rapid insights into how logistics optimization, e-payment integration, and warehousing automation influence order fulfillment speed, inventory turnover, and customer satisfaction in an e-commerce setting.

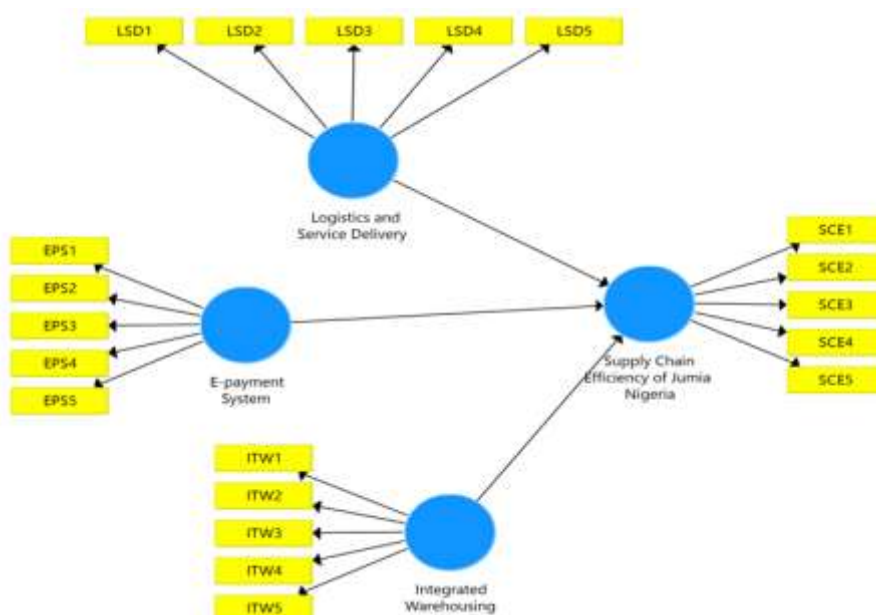
The target population consists of 275 staff across key digital and supply chain operations at Jumia Nigeria's Lagos facilities: 121 Supply Chain Managers & Logistics Partners, who focus on digital tools for delivery optimization and partner coordination across the Isolo Warehouse and various partner hubs; 65 E-commerce Operations & IT Specialists, who oversee platform integration, e-payments, and real-time data analytics at the Lagos Headquarters (HQ); and 89 Warehouse Staff, who are directly involved in automated picking/packing and stock tracking at the Main Warehouse Facility (e.g., Isolo), as obtained from Jumia Nigeria's Human Resources and Operations Records (2025). These groups were selected because they are directly involved in platform utilization, transaction processing, inventory management, and performance monitoring. This study employed proportionate stratified quota sampling to ensure balanced representation across functional roles. The population

of 275 staff was divided into three strata: Supply Chain Managers & Logistics Partners (n=121), E-commerce Operations & IT Specialists (n=65), and Warehouse Staff (n=89). Target quotas were set proportionally (44%, 24%, 32%). The Google Forms questionnaire was distributed electronically to all staff via official Jumia communication channels, with real-time monitoring of responses by stratum using a linked Google Sheet dashboard. Follow-up reminders were sent to under-represented groups to minimize non-response bias and achieve proportional coverage. Additionally, a 7-day automated reminder sequence was implemented using Google Forms’ built-in add-ons and email scheduling tools: an initial reminder at Day 3 for non-respondents, a second targeted nudge at Day 5 for lagging strata, and a final broadcast at Day 7 with a 48-hour countdown to survey closure. This approach, while relying on voluntary participation, ensured practical representativeness, reduced systematic non-response, and aligned with the heterogeneous contributions of each role to digital platform adoption and supply chain efficiency.

The structured questionnaire will be administered electronically through Google Forms, which allows efficient distribution, ensures convenience for respondents across locations, and reduces errors associated with manual data entry. Data will be collected using a structured questionnaire administered electronically, designed on a five-point Likert scale (Strongly Agree to Strongly Disagree). The questionnaire items for Logistics and Service Delivery (LSD1–LSD5) are adapted from Ijirshar et al. (2023), Mustapha & Adanla (2022), and Bagshaw (2019). E-payment System items (EPS1–EPS5) are drawn from Owuso & Jaja (2022), Ayaga & Nyagba (2022), and Kilay et al. (2022). Integrated Warehousing items (ITW1–ITW5) are based on Guliti et al. (2019), Kibrom (2019), and Bhatia & Shah (2024). Supply Chain Efficiency of Jumia Nigeria (SCE1–SCE5) is measured through order fulfillment speed, inventory turnover ratio, and customer satisfaction with delivery, adapted from Ivanov (2020), Christopher (2016), and Büyüközkan & Göçer (2018). Cronbach’s Alpha values were 0.979 for Logistics and Service Delivery, 0.984 for E-payment System, 0.990 for Integrated Warehousing, and 0.980 for Supply Chain Efficiency of Jumia Nigeria. All constructs exceeded the acceptable threshold of 0.70, demonstrating high internal consistency. Informed consent was obtained from all participants, and they were assured of confidentiality, voluntary participation, and the right to withdraw at any time. Data collected were used solely for academic purposes and handled with strict confidentiality to protect respondents’ identity.

For data analysis, Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS 3 was employed for data analysis. PLS-SEM was selected for its effectiveness in managing complex models with multiple latent variables and indicators, handling non-normal data, and providing robust results with moderate sample sizes. A Google Forms link was shared with 275 potential respondents, allowing 7 days for completion; 186 valid responses were received and used for analysis. The model is presented below:

Figure 1: Model of the Study



Source: SmartPLS Output, 2025.

DATA RESULTS AND DISCUSSIONS

The assessment of PLS-SEM results in this study encompasses the evaluation of the measurement model through reliability and validity assessments, discriminant validity via the Heterotrait-Monotrait ratio, and the structural model via path coefficients and bootstrapping outcomes.

Figure 2: Structural Model Results

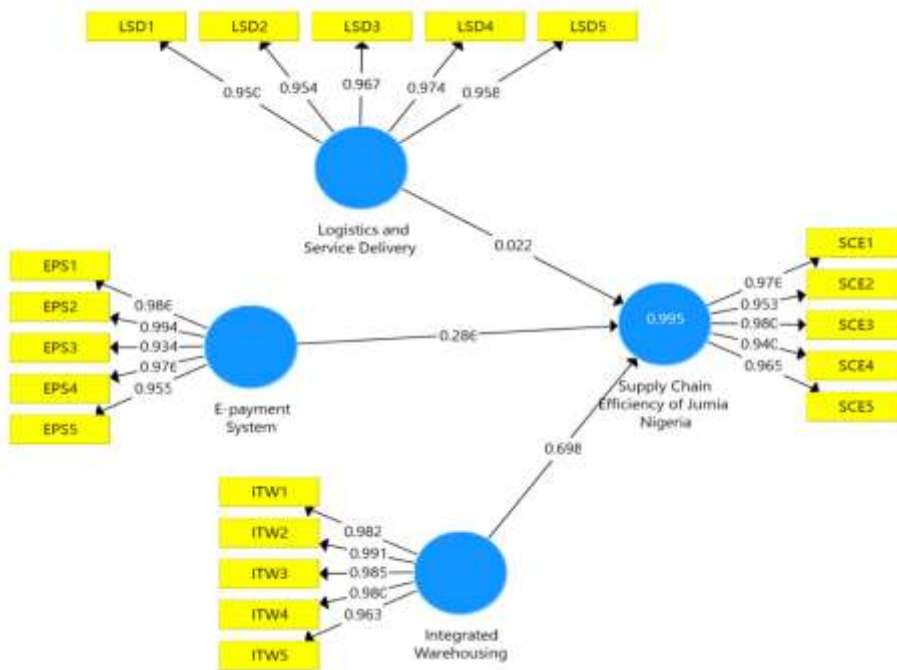


Table 1: Reliability and Validity Results of Study Constructs

S/N	Variables	Factor Loadings	Cronbach's Alpha	Composite Reliability	AVE	f ²	R ²
1	Logistics and Service Delivery (LSD)	LSD1 (0.950), LSD2 (0.954), LSD3 (0.967), LSD4 (0.974), LSD5 (0.958)	0.979	0.984	0.923	0.005	
2	E-payment System (EPS)	EPS1 (0.986), EPS2 (0.994), EPS3 (0.934), EPS4 (0.976), EPS5 (0.955)	0.984	0.987	0.939	1.222	
3	Integrated Warehousing (ITW)	ITW1 (0.982), ITW2 (0.991), ITW3 (0.985), ITW4 (0.980), ITW5 (0.963)	0.990	0.992	0.961	3.608	
4	Supply Chain Efficiency of Jumia Nigeria (SCE)	SCE1 (0.976), SCE2 (0.953), SCE3 (0.980), SCE4 (0.940), SCE5 (0.965)	0.980	0.984	0.927		0.995

Source: SmartPLS Output, 2025.

Table 1 presents the reliability and validity results for the constructs in the study on assessing the impact of digital platforms on supply chain efficiency of Jumia Nigeria. All factor loadings exceed 0.70 (Hair et al., 2019), confirming strong indicator reliability. Cronbach’s Alpha values range from 0.979 to 0.990, and Composite Reliability from 0.984 to 0.992, all above 0.70 (Nunnally, 1978; Fornell & Larcker, 1981), indicating excellent internal consistency. AVE values range from 0.923 to 0.961, all above 0.50, supporting convergent validity. The R² for Supply Chain Efficiency is 0.995 (adjusted R² = 0.995), meaning 99.5% of variance is explained by the independent variables, demonstrating exceptional predictive power (Hair et al., 2019). The f² effect sizes show Integrated Warehousing (3.608) has the largest influence, followed by E-payment System (1.222), while Logistics and Service Delivery (0.005) has a small but significant effect. These results confirmed the measurement model is highly reliable, valid, and suitable for structural analysis.

Table 2: Heterotrait-Monotrait Ratio (HTMT)

Variables	LSD	EPS	ITW	SCE
Logistics and Service Delivery (LSD)				
E-payment System (EPS)	0.559			
Integrated Warehousing (ITW)	0.586	0.570		
Supply Chain Efficiency of Jumia Nigeria (SCE)	0.690	0.693	0.780	

Source: SmartPLS Output, 2025.

Table 2 presents the Heterotrait-Monotrait Ratio (HTMT) results for Logistics and Service Delivery (LSD), E-payment System (EPS), Integrated Warehousing (ITW), and Supply Chain Efficiency of Jumia Nigeria (SCE). The HTMT values range from 0.559 to 0.780, all below the 0.90 threshold recommended by Henseler et al. (2015), thereby confirming satisfactory discriminant validity. This result indicates that the constructs are empirically distinct, strengthening the robustness of the measurement model.

Figure 3: Structural Model Bootstrapping Results

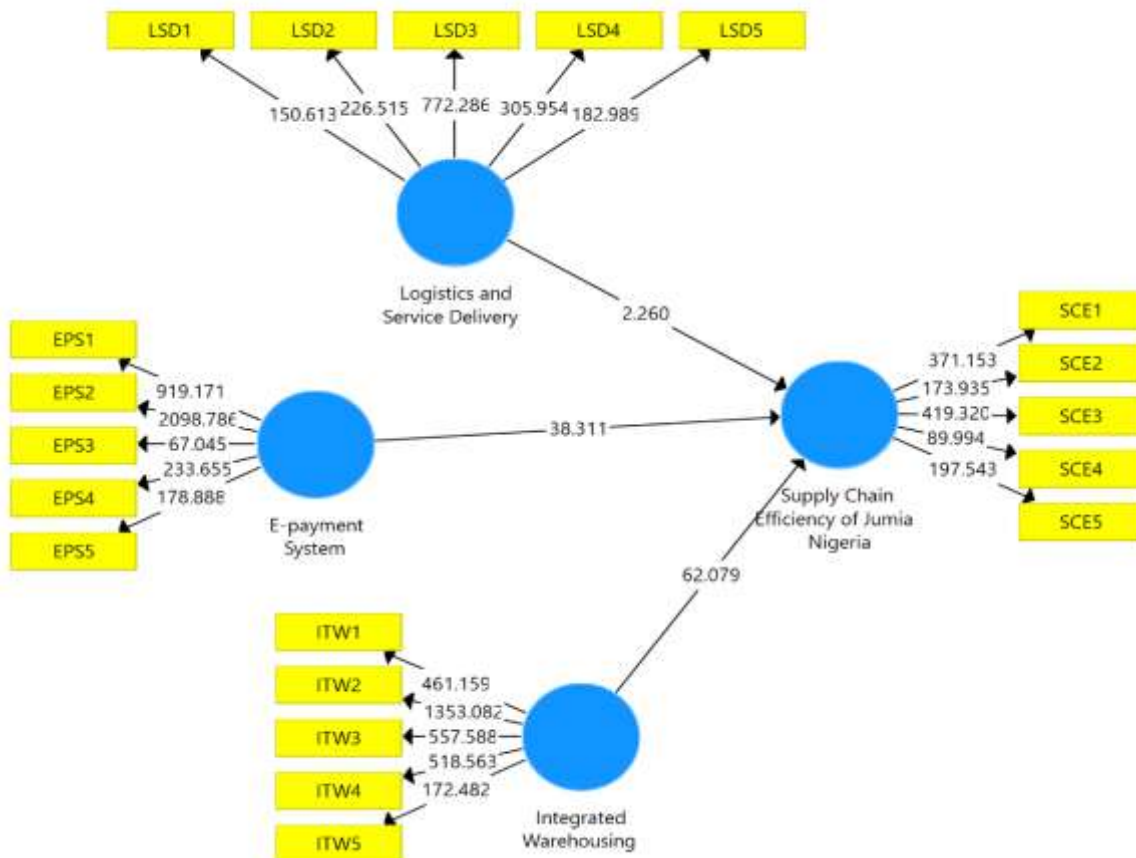


Table 4: Path Coefficients

Variable Relationship	Path Coefficient	T Statistics	P Values	Decision
Logistics and Service Delivery → Supply Chain Efficiency of Jumia Nigeria	0.022	2.260	0.052	Accepted (Not Significant)
E-payment System → Supply Chain Efficiency of Jumia Nigeria	0.286	38.311	0.000	Rejected (Significant)
Integrated Warehousing → Supply Chain Efficiency of Jumia Nigeria	0.698	62.079	0.000	Rejected (Significant)

Source: SmartPLS Output, 2025.

DISCUSSION OF FINDINGS

H₀₁: Logistics and Service Delivery does not significantly affect Supply Chain Efficiency of Jumia Nigeria.

The hypothesis is accepted. The path coefficient (0.022), T-statistic (2.260), and p-value (0.052 > 0.05) indicated a positive but non-significant relationship. Although logistics practices contribute marginally to order fulfillment speed, inventory turnover, and customer satisfaction, their impact remains limited in Jumia’s digital ecosystem. This suggests that while real-time tracking and delivery coordination matter, other platform features dominate efficiency gains.

The finding aligns with Ibrahim and Jiddah (2025), who reported moderate effects of order processing on Jumia’s performance in Abuja ($\beta = 0.427$, $R^2 = 0.387$), and Mustapha and Adanla (2022), noting delivery times explain only part of sales volume ($\beta = 0.179$). For Jumia Nigeria, this implies optimizing last-mile partnerships and route algorithms without over-relying on logistics as the primary driver. Enhancing integration with warehousing and payment systems could amplify marginal contributions.

H₀₂: The E-payment System does not significantly affect Supply Chain Efficiency of Jumia Nigeria.

This hypothesis is rejected. The path coefficient (0.286), T-statistic (38.311), and p-value (0.000 < 0.05) confirmed a positive and significant effect. Seamless e-payments accelerate transaction closure, reduce cart abandonment, and enable faster order releases into fulfillment pipelines, directly boosting order speed, turnover ratios, and delivery satisfaction. In Jumia’s context, secure gateways and instant refunds build trust, minimizing delays from payment verification.

This is consistent with Owuso and Jaja (2022), who found strong correlations between e-payment and delivery reliability ($r = .984$, $p < .01$) in Nigerian courier firms, and Ayaga and Nyagba (2022), reporting significant e-payment influence on consumer behavior at Jumia ($\beta = .161$, $p = .002$). The implication for Jumia is to expand mobile money integration, fraud detection, and multi-currency options. Strengthening e-payment infrastructure ensures frictionless cash flows, enhancing overall supply chain velocity and customer loyalty.

H₀₃: Integrated Warehousing does not significantly affect Supply Chain Efficiency of Jumia Nigeria.

This hypothesis is rejected. The path coefficient (0.698), T-statistic (62.079), and p-value (0.000 < 0.05) demonstrated the strongest positive significant impact. Automated inventory synchronization, real-time stock visibility, and optimized picking directly accelerate order fulfillment, maximize turnover, and ensure on-time deliveries. Jumia’s centralized and regional warehouses, powered by WMS and RFID, minimize stock-outs and overstocking, critical for e-commerce scalability.

The result supports Mwizerwa and Akumuntu (2024), who found inventory management significantly enhances supply chain performance, and Jantapoon (2025), reporting technology-integrated warehousing as the top driver ($\beta = 0.742$) in Thai e-commerce. For Jumia Nigeria, this underscores investing in smart warehousing, AI

forecasting, robotic automation, and nationwide hub expansion. Robust integrated warehousing remains the cornerstone for sustaining high efficiency metrics amid demand volatility.

Conclusion and Recommendations

This study concluded that digital platforms significantly enhance Supply Chain Efficiency at Jumia Nigeria, with Integrated Warehousing exerting the dominant influence, followed by E-payment Systems, while Logistics and Service Delivery show marginal contribution. The model explained 99.5% of variance, affirming platform synergy in driving order speed, inventory turnover, and delivery satisfaction.

Based on these findings, the following recommendations are proposed:

- i. Integrated Warehousing should be prioritized through adoption of AI-driven WMS, real-time IoT tracking, and decentralized micro-fulfillment centers to sustain high turnover and fulfillment speeds.
- ii. E-payment Systems should be fortified with expanded mobile wallets, biometric authentication, and instant refund protocols to reduce friction and accelerate order-to-cash cycles.
- iii. Logistics and Service Delivery, though non-significant alone, should be integrated via API linkages with warehousing and payments, focusing on predictive routing and third-party logistics optimization for incremental gains.

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Questionnaire:

Key: SA = Strongly Agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly Disagree

1. Logistics and Service Delivery (LSD1-5)

S/N	Statement	SD	D	U	A	SA
1	Digital platforms effectively optimize delivery routes to minimize delays.					
2	The use of digital platforms helps track real-time delivery progress efficiently.					
3	Customer satisfaction improves significantly due to faster deliveries enabled by digital platforms.					
4	The digital platform has reduced delivery times compared to traditional methods.					
5	Digital tools have improved the accuracy and reliability of Jumia’s delivery services.					

E-payment System (EPS1-5)

S/N	Statement	SD	D	U	A	SA
1	The e-payment system used by Jumia is seamless and reduces transaction errors.					
2	Digital payment platforms have reduced delays in order processing.					
3	The speed of payment processing has improved due to the use of digital platforms.					
4	Digital platforms have made Jumia’s payment verification process more efficient.					
5	Customers experience fewer payment issues due to the digital payment system.					

Integrated Warehousing (ITW1-5)

S/N	Statement	SD	D	U	A	SA
1	Digital platforms help in real-time tracking of inventory levels, improving stock management.					
2	The integration of digital tools has led to more efficient order fulfillment processes.					

3	Automated systems have significantly reduced the time taken for picking and packing orders.				
4	The digital platform has improved Jumia’s ability to avoid stockouts and overstocking.				
5	The use of digital platforms has streamlined the entire warehousing process, making it more efficient.				

Supply Chain Efficiency of Jumia Nigeria (SCE1-5)

S/N	Statement	SD	D	U	A	SA
1	Digital platforms have reduced the average time from order placement to delivery.					
2	The integration of digital platforms has improved Jumia’s inventory turnover ratio.					
3	The use of digital platforms has led to higher customer satisfaction with on-time deliveries.					
4	The digital tools in place have increased the overall speed and efficiency of order fulfillment.					
5	The real-time inventory tracking system has enhanced Jumia's ability to meet customer demand.					

Below is the data used for analyzing the impact of digital platforms on the supply chain efficiency of Jumia Nigeria. The table consists of responses to the survey questions related to the three independent variables (Logistics and Service Delivery, E-payment System, Integrated Warehousing) and the dependent variable (Supply Chain Efficiency) as measured by key metrics such as order fulfillment speed, inventory turnover ratio, and customer satisfaction.

Key:

- **LSD** refers to Logistics and Service Delivery metrics.
- **EPS** refers to E-payment System metrics.
- **ITW** refers to Integrated Warehousing metrics.
- **SCE** refers to Supply Chain Efficiency metrics.

S/N	LSD1	LSD2	LSD3	LSD4	LSD5	EPS1	EPS2	EPS3	EPS4	EPS5	ITW1	ITW2	ITW3	ITW4	ITW5	SCE1	SCE2	SCE3	SCE4	SCE5
1	4	4	4	4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	3
2	3	4	4	4	4	4	4	4	4	3	4	4	4	4	3	4	4	4	4	4
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