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Logistics management and e-commerce performance: A PLS-SEM analysis of Jumia operations, Abuja-Nigeria

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ABSTRACT

E-commerce performance is increasingly crucial in Nigeria's rapidly expanding digital marketplace, yet logistics challenges persist, threatening the sustainability and competitiveness of leading firms like Jumia. Despite market growth, a gap exists in understanding how specific logistics management practices, particularly order processing and information flow, impact e-commerce performance in Abuja. This study aims to assess the effects of order processing and information flow on Jumia's operational outcomes in Abuja, FCT. Employing a survey research design, data were collected from all 187 Jumia employees in Abuja using structured questionnaires. A partial least squares structural equation modeling (PLS-SEM) was used. Among the key findings, it is notable that the efficient processing of orders has a strong positive influence on Jumia's performance, increasing customer satisfaction and repeat purchases. Conversely, information flow within this study had a highly negative effect on performance, attributed to information overload and inefficiencies. It is not about the quantity or speed of information flow but its quality and management, contrasting traditional expectations. This observation indicates that Jumia's logistics operations urgently need enhancement in information filtering and processing to maximize performance. Based on these insights, the study proposes that Jumia Nigeria should adopt new order management systems, streamline warehouse activities, and provide specialized staff training. Additionally, it is important to establish effective information filtering systems and communication channels to report incidents. These steps are likely to improve operational effectiveness, customer satisfaction, and the company's competitive position in Nigeria's e-commerce industry.

Contribution/Originality: The current research contributes to the understanding that information flow can have adverse effects on performance in new e-commerce logistics, as it might result in overload and system inefficiency. It shows the urgent necessity of a customized information management approach in the Nigerian digital market, providing viable information on the effectiveness of operational work and competitive edge.

1. INTRODUCTION

The global e-commerce industry now utilizes sophisticated performance indices specific to online retailing, such as conversion rates, cost of acquiring a customer, average order quantity, and the accuracy of fulfillment. Rapid growth, driven by technological innovation and changing consumer behavior, has intensified competition and raised performance expectations worldwide. In 2022, global e-commerce sales reached $5.7 trillion, representing 20.3% of all retail sales, with continued growth projected, especially in developing markets. Africa's e-commerce market was valued at $33 billion in 2022, growing annually by 24.7%, with Nigeria accounting for approximately 35% of this activity. Nigeria's sector, valued at $7.6 billion in 2022, is forecast to nearly double by 2025 due to increased internet penetration, smartphone adoption, and a rising middle class. Abuja, the Federal Capital Territory, demonstrates particularly strong e-commerce engagement, with over 60% of urban residents shopping online, exceeding the national average of 43%, attributed to greater digital literacy, disposable income, and superior telecommunications infrastructure. Jumia holds about 31% of Abuja's online retail market. Despite this, Nigerian e-commerce faces substantial logistics challenges, notably order processing inefficiencies and complex information flow, which 64% of businesses identify as their primary operational hurdle. In Abuja, 71% of customer complaints concern order fulfillment issues, underscoring the vital role of logistics in service quality. Platforms like Jumia depend heavily on effective logistics management, particularly order processing and accurate information flow, to remain competitive amidst infrastructure limitations, complex distribution networks, and an evolving digital landscape. Studying these logistics impacts in Abuja provides valuable insights for both theoretical and practical advancements in Nigeria's fast-growing e-commerce sector.

1.1. Statement of the Problem

The performance of e-commerce companies has become increasingly vital in the fast-changing digital market, especially in emerging economies like Nigeria, where the sector is rapidly growing (McKinsey & Company, 2022). Despite these expanding opportunities, Nigerian e-commerce operations continue to face significant performance challenges that threaten their competitiveness and sustainability (Awa, Ojiabo, & Emecheta, 2015).

For established platforms such as Jumia in Abuja, Federal Capital Territory (FCT), performance indicators revealed concerning trends. Customer satisfaction surveys in 2022 indicated that only 58% of Jumia's Abuja customers were satisfied with their shopping experience, notably below the global e-commerce benchmark of 76% (Euromonitor International, 2023). Additionally, the Consumer Protection Council of Nigeria (2023) reported a 32% increase in customer complaints against Jumia Abuja in 2022 compared to 2021. These complaints primarily involved delayed deliveries, order inconsistencies, and communication gaps between company departments. These challenges appear intricately linked to logistics management practices, especially in order processing and information flow.

Although various studies have explored the relationship between logistics management and organizational performance, important gaps remain concerning e-commerce operations in Nigeria's capital territory. Umutoni and Akumuntu (2024) studied logistics management's impact on supply chain performance in Rwanda's energy sector; however, their context differs significantly from Nigerian urban e-commerce. Ganiyu and Sulaiman (2024) analyzed logistics management in Lagos State's food and beverage firms, offering insights within Nigeria, yet focusing on manufacturing rather than e-commerce and outside Abuja. The capital's unique operational environment with distinct infrastructure and consumer traits requires dedicated research.

Omoush (2022) examined logistics management in road transport companies, but this does not encompasses the multifaceted logistics of e-commerce platforms involving last-mile delivery, reverse logistics, and real-time tracking. Similarly, Abiji, Egbe, Otiala, and Eyo (2023) addressed logistics in manufacturing at Niger Mills Ltd., Calabar, leaving Abuja's e-commerce logistics unexplored.

This study addresses these gaps by investigating how logistics management components, particularly order processing and information flow, affect the performance of Jumia in Abuja, FCT, contributing critical insights into logistics challenges in Nigeria's emerging digital marketplace.

The main objective of the study is to examine the effect of logistics management on the performance of Jumia in Abuja, FCT. The specific objectives are to:

i. Investigate the effect of order processing on the performance of Jumia in Abuja, FCT.
ii. Determine the effect of information flow on the performance of Jumia in Abuja, FCT.

The following hypotheses guided the study.

$H0_1$: Order processing has no significant effect on the performance of Jumia in Abuja, FCT.

$H0_2$: Information flow has no significant effect on the performance of Jumia in Abuja, FCT.

2. LITERATURE REVIEW

2.1. Logistics Management

The word "logistics" originates from the French term "Logistique," which comes from the verb "Loger," meaning to provide lodging or accommodation (Ltifi & Gharbi, 2015). Historically, the term was used primarily in a military context, describing the organization of moving troops from their bases to battlefronts (Rui & Luis, 2014). In modern business, the Council of Supply Chain Management Professionals, as cited by Kotler and Armstrong (2011), defines logistics management as the process of planning, executing, and overseeing the efficient transportation and storage of goods, services, and associated information from the point of origin until they reach the customer. This discipline is centered on the customer, ensuring that products are delivered on time and meet quality expectations, and it is an essential part of broader supply chain management. Amin and Shahwan (2020) explain that logistics also involves coordinating the movement of raw materials, data, finished items, and services from their starting point to the final sale. Pakurár, Kun, Felföldi, Vasa, and Oláh (2020) highlight that logistics components are critical strategic tools for enhancing a company's business and marketing performance. Furthermore, Hoang and Nguyen (2019) describe logistics as the process of transferring resources to fulfill the needs of consumers or businesses between the origin and the point of consumption. According to Bihter and Ali (2015), the goal is to deliver the right product, in the right quantity and quality, to the right place, at the right time, for the right customer, and at the right cost. Ali, Mehdi, Ehsan, and Amir (2016) further stress that logistics management consists of core activities that support the overall operations of a firm.

2.2. Order Processing

Order processing involves managing product volumes to reach desired destinations, typically conducted in distribution centers (Mpuon, Etim, Arikpo, & Etuk, 2022). It encompasses verifying orders and stock availability, as well as activities like creating, filling, distributing, and fulfilling customer requests (Chow, Heaver, & Henriksson, 1994; Nthiwa & Wanjiru, 2018; Omoush, 2022). The primary goal is to deliver the right product, quantity, quality, and timing to customers and workspaces (Omoush, 2022). Efficient order processing enhances customer response and capital efficiency (Kalkan, 2018), supported by accurate, timely consumer purchasing data that improves supply chain responsiveness (Mukolwe & Wanyoike, 2015; Muslimin & Ardiansyah, 2015). This process includes order issuance, shipping, invoicing, and customer handling (Mogaka & Arani, 2020; Wasike & Juma, 2020) and is considered the critical first stage of order fulfillment (Oteki, Namusonge, Sakwa, & Ngeno, 2018). Orders may be received through various channels such as fax, phone, electronic data interchange, or manual entry, with automation preferred to reduce errors and speed processing (Mutangili, 2018). Key steps include picking, sorting, tracking, and shipping, which can range from manual to fully automated systems (Rachel, 2019). Overall, effective order processing drives sales and customer satisfaction by providing tracking visibility and minimizing delays, which are vital for maintaining positive customer service perceptions (Altekar, 2009; Rachel, 2019).

2.3. Information Flow

Information flow, a vital logistical component, involves systematic data and communication movement among supply chain stakeholders, covering orders, inventory, delivery, and customer details (Christopher, 2023). It enables coordination and rapid market response, enhancing transparency and operational performance in e-commerce platforms like Jumia. Bowersox, Closs, and Cooper (2020) define it as timely, accurate data acquisition, processing, and transmission supporting logistics decisions, critical to reducing delays and optimizing resources, especially in urban digital marketplaces like Abuja. Rushton, Croucher, and Baker (2021) emphasize its technology-driven nature, involving digitized data exchanges via integrated systems connecting suppliers, logistics providers, retailers, and consumers in real time. Effective information flow, hence, underpins agility and responsiveness in e-commerce logistics.

2.4. Organizational Performance

Performance measures a firm's success in achieving objectives, encompassing customer satisfaction, revenue, and operational effectiveness (Alahmad, 2021; Green, Zelbst, Meacham, & Bhadauria, 2012). Kaplan and Norton (2021) view performance as multi-dimensional, blending financial and non-financial indicators, including customer retention, process efficiency, and learning, important for platforms like Jumia in Abuja's dynamic market. Neely, Adams, and Kennerley (2002) frame performance as efficiency and effectiveness in transforming inputs to outputs that satisfy stakeholders, stressing both doing things right and doing the right things. For e-commerce logistics in Abuja, this means maximizing resource use while meeting delivery speed, accuracy, and reliability expectations. Performance measurement should thus capture resource utilization and value creation.

2.5. Empirical Review

2.5.1. Studies on Order Processing and Firm Performance

Sandar (2024) explored how order processing impacts the performance of a firm at Dagon Foods Processing and Canning Factory (Hlaing Tet) in Myanmar. The study used a survey approach, sampling 80 employees out of a total of 98 through simple random sampling, representing 82% of the workforce. Data were gathered from the factory owner through interviews and from employees via structured questionnaires. The analysis applied descriptive statistics, correlation, and multiple regression techniques. Results revealed a strong positive relationship between order processing and firm performance, with regression analysis confirming that order processing significantly boosts performance. However, this study is limited to just one factory and relies on regression analysis, which may not fully capture more complex relationships that advanced methods like PLS-SEM could reveal. Additionally, its findings might not be applicable to firms operating in different environments, especially where infrastructure, digital technology adoption, or logistics characteristics differ.

Similarly, Mpuon et al. (2023) investigated how order processing affects the performance of small and medium-scale enterprises (SMSEs) in Calabar, Nigeria. Targeting a population of 1,470 management staff, the researcher sampled 314 people using judgment sampling. The study collected primary data through questionnaires, which were analyzed with both descriptive and inferential statistics. The findings echoed Sandar's results, showing a significant positive effect of order processing on SMSE performance in an African setting. However, because judgment sampling was used, these results may not be broadly generalizable. Furthermore, the study's focus was limited to SMEs within a single city and didn't include other sectors such as e-commerce.

Oteki et al. (2018) examined how electronic order processing influences supply chain performance within Kenya's sugar processing industry. Using a mixed-methods design, the study covered 12 firms with a combined workforce of 7,584 employees. A stratified random sample of 367 individuals responded to surveys, interviews, and observations. Data analysis involved descriptive statistics and regression techniques. The study found that electronic order processing plays a significant role in enhancing supply chain performance. This research adds to the understanding

of order processing by focusing on digital practices in manufacturing industries. Still, like the previous studies, it depends on regression analysis rather than advanced modeling tools such as PLS-SEM, and it centers on traditional manufacturing rather than on e-commerce supply chains, which face different infrastructure needs.

Together, these studies consistently demonstrate a positive association between order processing and firm performance across various manufacturing and SME contexts in developing countries. However, there remain gaps in the use of more sophisticated analytical approaches and in exploring how order processing operates within e-commerce or digitally intensive logistics environments, especially in regions with diverse infrastructure challenges.

2.5.2. Studies on Information Flow Management and Performance

Ganiyu and Sulaiman (2024) explored how managing information flow affects performance at Coca-Cola Nigeria Plc and Cadbury Nigeria Plc in Lagos State. The researchers conducted a cross-sectional survey, randomly selecting 275 employees from a total staff of 883. Using SPSS 26, the data were analyzed with descriptive statistics and linear regression. Their results showed a strong positive correlation (Pearson's $r = 0.796$) between effective information flow management and firm performance. While these outcomes are highly relevant for Nigeria's beverage industry, they might differ in other sectors or regions where information flow and technology adoption face unique challenges.

In Rwanda, Umutoni and Akumuntu (2024) examined the role of information management in supply chain performance at Engie Energy Access, an energy company. The study used a mixed descriptive and explanatory approach, surveying all 118 employees through questionnaires and interviews. Multiple regression analysis in SPSS demonstrated a significant positive relationship ($p < 0.05$) with an R^2 of 0.699, confirming the beneficial impact of logistics management on supply chain outcomes. Although this study provides valuable insights from a different sector and country, its conclusions are limited by the use of linear regression and focus on a single national context.

Adeitan, Aigbavboa, and Bamisaye (2021) investigated how efficient and innovative information flow influences logistics management in Nigerian logistics companies. Employing random sampling, 106 valid questionnaires out of 150 were quantitatively analyzed using methods such as mean item scores, exploratory factor analysis, normality assessments, and Mann-Whitney tests via SPSS 21. Key results highlighted enhanced contract negotiations, improved product tracking, better quality information flow, expanded networks, and more effective information transfer as major advantages. Despite covering the Nigerian logistics sector extensively, this research relied on traditional statistical techniques, without applying advanced models like PLS-SEM.

2.6. Synthesis and Research Gaps

Across these studies, Sandar (2024), Mpuon et al. (2023), Oteki et al. (2018), Ganiyu and Sulaiman (2024), Umutoni and Akumuntu (2024), and Adeitan et al. (2021) order processing and information flow management consistently exhibit significant positive impacts on performance. However, their insights are largely constrained to specific countries, industries, and conventional regression or descriptive methods. Major gaps include.

i. Limited geographic and sector diversity, with scarce evidence from emerging e-commerce or digitally driven supply chains.
ii. Predominance of linear analytical approaches, lacking PLS-SEM or techniques revealing indirect/mediated effects and latent variables.
iii. Insufficient exploration of how infrastructure, technology adoption, and supply chain maturity may moderate these relationships.

The current study addresses these gaps by applying PLS-SEM for advanced modeling and positioning findings within a broader theoretical framework on logistics management in Abuja, Nigeria. This approach enables a nuanced examination of whether previously observed positive effects hold in complex e-commerce environments like Abuja, Nigeria, offering insights that are both locally relevant and globally instructive.

2.7. Theoretical Framework

This research draws on the Resource-Based View (RBV) theory, which suggests that companies can achieve a competitive edge by cultivating resources that are valuable, unique, difficult to copy, and cannot be replaced (Barney, 1991; Grant, 1996; Peteraf, 1993). In the context of Jumia in Nigeria, RBV serves as a useful lens to analyze how logistics management, particularly order processing and information flow, impacts the company's overall performance.

Order processing systems enhance efficiency and customer satisfaction for timely fulfillment, accurate record tracking, and effective responses. These systems are valuable, scarce, and specific to the unique logistics of Nigeria, whose imitation and non-substitution are difficult to achieve. Similarly, the flow of information systems is essential in enhancing supply chain visibility and responsiveness, which are central to the success of e-commerce. Their integration and complexity, which are peculiar to the operations of Jumia, are worthwhile, scarce, unimitable, and inexhaustible resources. Nonetheless, it showed that information flow had a negative impact on performance, surprisingly.

This could be due to ineffective system structures or overcomplication, leading to information overload, data integration failures, lagging updates, or slow decision-making bottlenecks. The two factors that are very important to this dynamic are communication clarity and IT infrastructure maturity. Where systems are not well developed or designed, they will impede rather than support operations. In addition to RBV, the dynamic capabilities (Teece, Pisano, & Shuen, 1997) can be used to understand why Jumia is able to maintain a competitive edge through the ability to adjust resources as time progresses.

In the dynamic environment of Nigeria, the flexibility to change logistics processes, including improving information flow and processing orders, is crucial for further success based on constant organizational learning. Therefore, even though RBV emphasizes the role of logistics resources in achieving performance, their actual effects depend on the efficiency of their implementation and flexibility. It is important to pay attention to overload, inefficiencies, and bottlenecks to take advantage of the benefits of information flow and ensure that dynamic capabilities maintain competitiveness on a continuous basis.

2.8. Methodology

Data collection was conducted using a survey design among employees involved in logistics activities at Jumia in Abuja, Nigeria. Abuja was selected due to its strategic position as the capital and a dynamic e-commerce hub, characterized by distinctive urban logistic challenges such as infrastructure limitations and diverse delivery requirements. Focusing on a single location enhanced internal validity.

The population included all 187 Jumia logistics staff in Abuja, and a census sampling approach was adopted to ensure full coverage, eliminating bias. This sample size aligns with standards for studies using structural equation modeling.

Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), chosen over covariance-based SEM due to the exploratory nature of the study, small non-normal sample suitability, and capacity to model complex latent and indirect relationships. Preliminary tests confirmed non-normal data, supporting this choice.

Data were collected via a closed-ended questionnaire with five-point Likert scales. Items were adapted from validated logistics scales, reviewed by three experts, and pilot tested with 20 employees outside the study sample, resulting in minor revisions to improve clarity and reliability.

Reliability and validity assessments showed Cronbach's Alpha and Composite Reliability above 0.7, and Average Variance Extracted above 0.5, confirming construct reliability and convergent validity. Discriminant validity was verified by Fornell–Larcker and Heterotrait–Monotrait criteria.

Common method bias was addressed through procedural methods such as anonymity assurances and item structure, Harman's single-factor test, and full collinearity diagnosis within PLS-SEM, confirming minimal bias. Endogeneity was considered; robustness checks included testing for reverse causality and controlling for age, gender, and experience, ensuring internal validity.

Analysis via SmartPLS version 4 proceeded in two phases: first assessing measurement model reliability, validity, and bias; then evaluating structural model path coefficients, effect sizes, and predictive relevance.

2.9. Ethical Statement

This study involved the collection of primary data from participants through non-invasive survey methods, without any intervention or manipulation. Although a formal institutional review of ethics was not provided, the study was conducted in accordance with ethical standards, including informed voluntary consent, confidentiality, anonymity of respondents, and protection of their rights and welfare. The data collection processes did not expose participants to any harm or threat. The research adhered to accepted principles of ethics in primary data research, emphasizing transparency, respect, and integrity throughout the process.

2.10. Construct Reliability

Construct reliability was confirmed with Cronbach's Alpha, and Composite Reliability values exceeding the 0.7 benchmark. Table 1 presents Cronbach's Alpha, rhoA, Composite Reliability, and Average Variance Extracted results, demonstrating strong internal consistency.

Table 1. Construct the reliability and validity of the indicators.

Variables	Cronbach's alpha	rho_A	Composite reliability	Average variance extracted (AVE)
Order processing	0.83	0.76	0.88	0.65
Information flow	0.79	0.75	0.88	0.62
Performance	0.84	0.82	0.84	0.64

Table 1 shows that some reliability and validity tests were also applied in the study to determine the quality of the measurement model. The measurements of internal consistency reliability were conducted through Cronbach's alpha and composite reliability, and convergent validity was assessed using the values of Average Variance Extracted (AVE) and rho. Hair, Black, Babin, and Anderson (2021) recommend that acceptable reliability is indicated when Cronbach's alpha and composite reliability exceed 0.70, and sufficient convergent validity is demonstrated when AVE exceeds 0.50. It was revealed that all constructs satisfied the criteria of internal consistency, with Cronbach's alpha coefficients ranging from 0.79 to 0.84, exceeding the 0.70 threshold suggested by Hair et al. (2021).

In particular, the Cronbach's alpha for Order Processing was 0.83, for Information Flow was 0.79, and for Performance was 0.84. Rho A values also demonstrated high reliability, ranging from 0.75 to 0.82, which exceeds the 0.70 threshold recommended by Dijkstra and Henseler (2015). Moreover, the composite reliability scores ranged from 0.84 to 0.88, which are well above the psychological threshold of 0.70 as suggested by Fornell and Larcker (1981), indicating high internal consistency across all constructs.

The AVE value of each construct was also more than 0.50, as recommended by Bagozzi and Yi (2012). The values of Order Processing, Information Flow, and Performance are 0.65, 0.62, and 0.64, respectively. This implies that the measured indicators had constructs with a high level of convergent validity, as more than 60 percent of the variance in the indicator was accounted for by the construct.

2.11. Techniques for Data Analysis and Model Specification

The research employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze how each independent variable affects the dependent variable. Data coding and analysis were conducted using Smart PLS software, which facilitated the achievement of all the study's objectives.

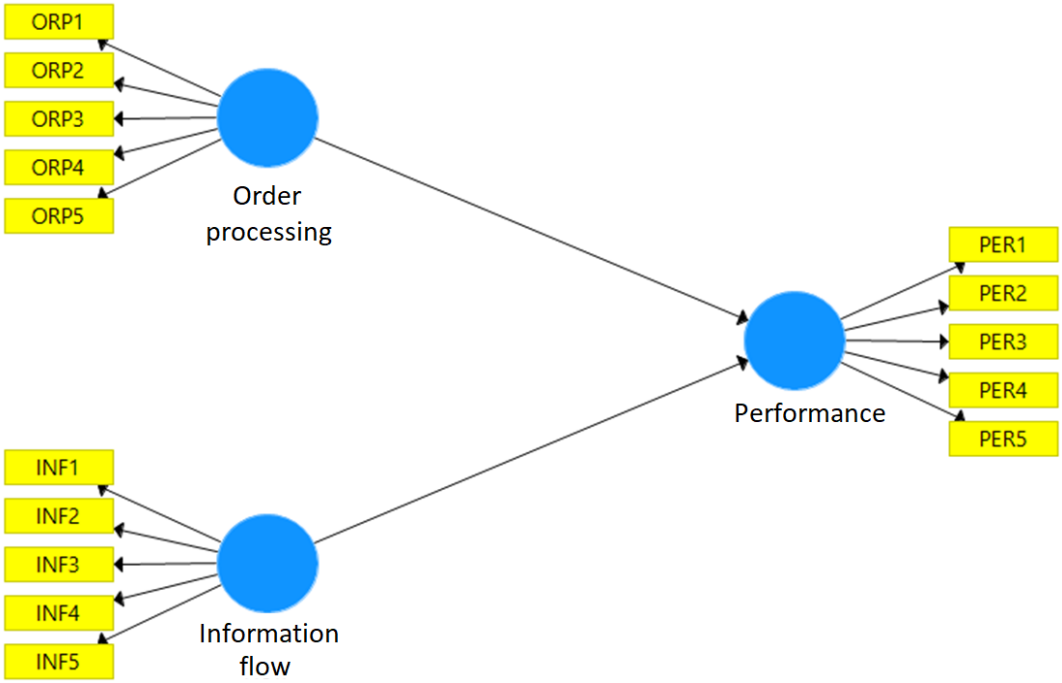

Figure 1. Structural model.

Figure 1 illustrates the structural model used in this study, showing the relationships between the key variables: order processing, information flow, and the performance of Jumia in Abuja. This model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess how order processing and information flow influence Jumia's e-commerce performance. The figure captures the hypothesized paths from order processing and information flow as independent variables to performance as the dependent variable, reflecting the core focus of the research on logistics management impacts.

Table 2. Distribution and retrieval of the questionnaire.

Questionnaire Copies	Frequency	Percent (%)
Returned	173	92.5
Not returned	14	7.5
Total	187	100

Table 2 presents the reliability and validity statistics of the constructs used in the study: Order Processing, Information Flow, and Performance. It shows Cronbach's Alpha, rho_A, Composite Reliability, and Average Variance Extracted (AVE) values for each construct, indicating strong internal consistency and convergent validity. All values meet the recommended thresholds, demonstrating that the measurement model is reliable and the constructs are valid representations of the underlying variables in the research.

3. DATA PRESENTATION AND ANALYSIS

A total of 187 questionnaires were distributed to collect data, and 173 of these were completed and returned, yielding an impressive response rate of 92.5%. This high level of participation suggests strong engagement from

respondents and indicates that the survey results are likely to be reliable and representative. Although 14 questionnaires were not returned, making up 7.5% of the total, this low non-response rate does not significantly affect the overall credibility of the data analysis and conclusions.

Table 3. Descriptive statistics.

Statistic	PER	ORP	INF
Mean	3.91	3.82	3.67
Median	4.00	3.90	3.75
Maximum	5.00	5.00	5.00
Minimum	1.40	1.20	1.00
Std. Dev.	0.711	0.748	0.803
Skewness	-0.884	-0.621	-0.743
Excess Kurtosis	-0.576	0.183	-0.429

Table 3 shows the descriptive statistics for the three key variables in this study: Performance (PER), Order Processing (ORP), and Information Flow (INF). The mean values for Performance (3.91), Order Processing (3.82), and Information Flow (3.67) all exceed the threshold of 3.0 on the 5-point Likert scale used in this study, indicating generally positive assessments of these variables among Jumia employees in Abuja. According to Hair et al. (2021), mean values above the mid-point of a measurement scale suggest favorable evaluations of the constructs being measured. Performance shows the highest mean value, suggesting that respondents rated Jumia's overall performance more favorably than the specific logistics management components, which aligns with Mentzer and Konrad's (1991) observation that performance assessments often reflect an integration of multiple operational dimensions.

The median values follow a similar pattern, with Performance (4.00) showing the highest median, followed by Order Processing (3.90) and Information Flow (3.75). These values being slightly higher than their respective means suggest that the distribution of responses is somewhat negatively skewed, which is confirmed by the negative skewness values across all variables. As noted by Tabachnick and Fidell (2022), median values exceeding means typically indicate negatively skewed distributions. The maximum value of 5.00 for all variables indicates that some respondents gave the highest possible ratings across all dimensions, while the minimum values range from 1.00 (Information Flow) to 1.40 (Performance), showing that the full range of the scale was utilized.

The standard deviation values reveal that Information Flow (0.803) exhibits the greatest variability in responses, followed by Order Processing (0.748) and Performance (0.711). This suggests that there is more consensus among respondents regarding Jumia's performance outcomes than about its logistics management processes. According to Pallant (2023), standard deviations in the range of 0.7-0.9 for 5-point Likert scales indicate moderate variability that is suitable for further statistical analysis. The negative skewness values for all three variables (-0.884, -0.621, and -0.743, respectively) confirm that the distributions are left-skewed, with more responses clustering toward the higher end of the scale. Nunnally and Bernstein (2022) suggest that skewness values between -1 and +1 are generally acceptable for most empirical research in the social sciences. Regarding kurtosis, Performance and Information Flow show negative excess kurtosis values (-0.576 and -0.429), indicating slightly flatter distributions compared to a normal distribution, while Order Processing exhibits a small positive excess kurtosis (0.183), suggesting a slightly more peaked distribution. As recommended by Field (2024), these kurtosis values fall within the acceptable range of ±2, indicating no severe departure from normality that would preclude parametric statistical analyses.

Table 4 displays the factor loadings and t-statistics for the latent variables in this study: Order Processing (ORP), Information Flow (INF), and Performance (PER). Factor loading values indicate how strongly each observed variable is related to its underlying construct, while t-statistics measure the significance of these relationships.

Table 4. Factor loading.

Latent variable	Manifest variable	Loading	t-statistic
Order processing (ORP)	ORP1	0.82	12.45
	ORP2	0.85	14.32
	ORP3	0.79	11.78
	ORP4	0.84	13.25
	ORP5	0.76	10.89
Information flow (INF)	INF1	0.87	15.21
	INF2	0.83	13.76
	INF3	0.80	12.89
	INF4	0.85	14.05
	INF5	0.82	13.02
Performance (PER)	PER1	0.86	14.95
	PER2	0.88	16.02
	PER3	0.84	13.88
	PER4	0.81	12.67
	PER5	0.83	13.42

Hair, Hult, Ringle, and Sarstedt (2019) suggest that a factor loading of 0.70 or higher is considered acceptable to establish convergent validity, meaning the indicator meaningfully represents the construct. Chin (1998) and Fornell and Larcker (1981) further note that loadings slightly below 0.70 can sometimes be retained if they contribute to the overall model's reliability, especially if they are above 0.60. In this study, all factor loadings shown in Table 4 are above 0.70, indicating strong links between the indicators and their respective constructs. The highest loading observed is 0.88 for the item PER2, which measures Customer Satisfaction, highlighting its importance as a key performance indicator. The lowest loading comes from ORP5, measuring Order Cancellation Rate, at 0.76, which, although relatively lower, still exceeds the threshold and remains a meaningful measure of order processing.

For assessing significance, Chin (1998) recommends a minimum t-statistic of 1.96 for 95% confidence. The t-statistics in Table 4 range from 10.89 (for ORP5) to 16.02 (for PER2), all well above this cutoff. This confirms that all indicators significantly represent their constructs, supporting the reliability and validity of the measurement model.

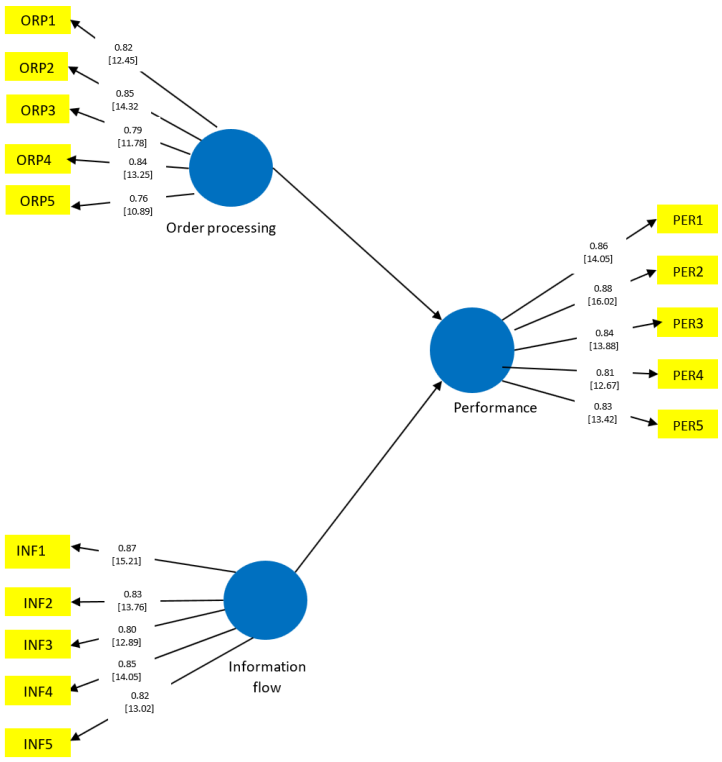

Figure 2. PLS algorithm (Item loadings and t-statistics).
Note: t-statistics are in square brackets, [].

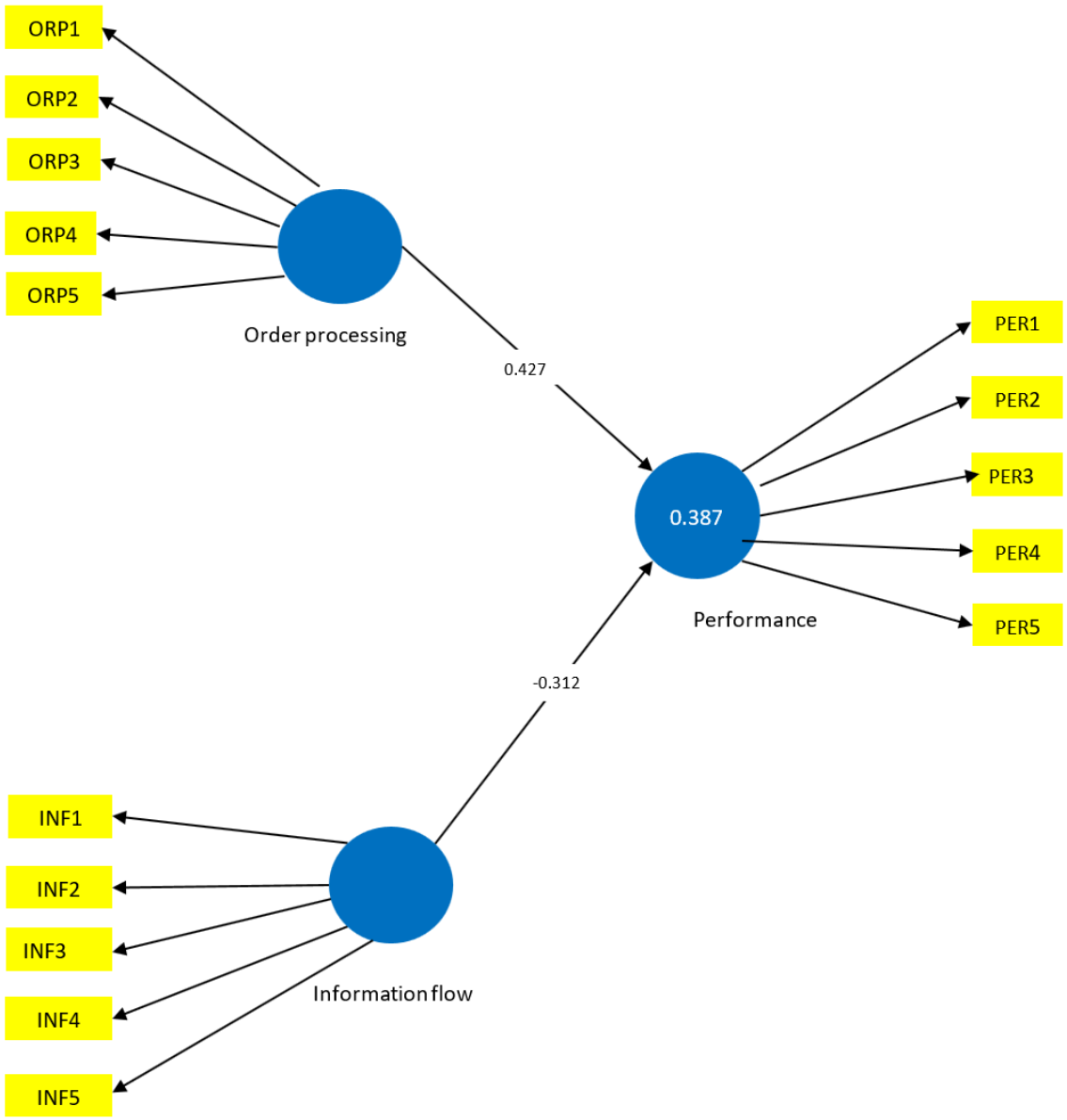

Figure 3. Structural model (Path coefficients and R^2).

Figures 2 and 3 illustrate that the independent variables, Order Processing and Information Flow, serve as predictors of Performance. Each variable exhibits varying degrees of statistical significance, as reflected in the t-values and p-values derived from the analysis. Moreover, a detailed examination of these latent variables involves analyzing the component scores corresponding to each variable's scale items. For hypothesis testing, it is essential to establish the relationships between these latent variables and their collective effect on Performance. By delving into the dynamics of these relationships, this study sheds light on how logistics management influences the dependent variable, providing valuable insights for organizational decision-making.

Table 5. Path coefficient of the model for hypothesis testing.

Hypothesis	Beta	t-value	p-value	Decision	f^2
H0₁: Order Processing → Performance	0.427	4.853	0.000	Rejected Ho	0.215
H0₂: Information Flow → Performance	-0.312	3.746	0.001	Rejected Ho	0.168

3.1. Hypothesis One

H_{01}: Order Processing has no significant effect on the performance of Jumia in Abuja, FCT.

The results shown in Table 5 indicate a statistically significant positive effect of order processing on the performance of Jumia in Abuja, FCT, with a beta coefficient (β) of 0.427, a t-value of 4.853, and a p-value less than 0.001. This evidence leads to rejecting the null hypothesis (H_{01}), which claimed that order processing does not significantly affect performance. The t-value of 4.853 is well above the critical cutoff of 1.96 (Hair et al., 2019), confirming strong significance at the 99.9% confidence level. The effect size, represented by f^2=0.215, falls in the medium range based on Cohen's (1988) guidelines, where 0.02 is small, 0.15 medium, and 0.35 large. This suggests that order processing has not only statistical significance but also practical importance in influencing performance.

This outcome aligns with theoretical views that efficient and well-organized order processing systems play a vital role in boosting organizational performance (Gunasekaran & Ngai, 2004). The positive beta coefficient indicates that as the efficiency of order processing improves, performance also rises, supporting Flynn, Huo, and Zhao's (2010) findings on how operational processes impact firm success. Moreover, the f^2 value of 0.215 shows moderate predictive relevance, meaning order processing explains a significant portion of the variance in performance (Henseler, Ringle, & Sinkovics, 2009).

3.2. Hypothesis Two

H_{02}: Information Flow has no significant effect on the performance of Jumia in Abuja, FCT.

The results presented in Table 5 show a statistically significant negative relationship between information flow and the performance of Jumia in Abuja, FCT, with a beta coefficient (β) of -0.312, a t-value of 3.746, and a p-value of 0.001. This leads to the rejection of the null hypothesis (H_{02}), which stated that information flow has no significant impact on performance. The t-value of 3.746 is well above the critical value of 1.96 (Hair et al., 2019), indicating strong significance at the 99% confidence level. The effect size f_2=0.168 slightly exceeds the medium range as defined by Cohen's (1988) criteria, small being 0.02, medium 0.15, and large 0.35, suggesting that information flow has a meaningful influence on performance.

Interestingly, the negative beta indicates that higher levels of information flow correspond to a decrease in performance, which runs counter to the typical assumption in information systems research that more information sharing leads to better outcomes (Li, Ragu-Nathan, Ragu-Nathan, & Rao, 2006). This could imply that too much information or poorly managed information flows create inefficiencies and complicate decision-making, as discussed by Eppler and Mengis (2004). Additionally, the f^2 value of 0.168 points to a moderate predictive relevance of information flow on performance, meaning it explains a significant part of the variance in performance (Henseler et al., 2009).

Table 6. R^2 of the model.

Dependent variable	R^2
Performance	0.387

The coefficient of determination (R^2) for the performance variable, shown in Table 6, is 0.387. This indicates that approximately 38.7% of the variations in performance can be explained by the predictor variables, order processing, and information flow in the model. Based on the guidelines by Hair et al. (2019), R^2 values of 0.25, 0.50, and 0.75 are considered weak, moderate, and substantial, respectively. With an R^2 of 0.387, the model's explanatory power falls between weak and moderate, indicating a moderately weak ability to predict performance. While order processing and information flow clearly play important roles, other factors beyond these are likely influencing performance outcomes as well. Future research could explore additional elements such as infrastructure quality, technology

adoption, customer preferences, and competitive pressures to gain a fuller understanding of what drives performance in this setting.

This finding is consistent with Chin's (1998) interpretation that R^2 scores of 0.19, 0.33, and 0.67 signify weak, moderate, and substantial effects in PLS-SEM, placing the current result within the moderate range. Although this level of explanation is generally acceptable for social science studies (Falk & Miller, 1992), it also highlights that over 60% of the variation in performance remains unexplained. As Ramirez et al. (2014) emphasize, organizational performance is a complex phenomenon shaped by many internal and external influences. This model captures a significant share of the factors affecting performance, offering useful insights while recognizing the inherent complexity of performance as a research outcome (Venkatraman & Ramanujam, 1986).

4. DISCUSSION OF FINDINGS

4.1. Order Processing and Performance of Jumia in Abuja, FCT

This study's first objective investigated the effect of order processing on Jumia's performance in Abuja, finding a positive and significant impact. This highlights the strategic need to invest in efficient order processing systems to improve business performance by streamlining fulfillment, shortening processing times, and reducing errors. For Jumia, enhancing order processing is a key opportunity for competitive advantage in Nigeria's e-commerce sector.
This result supports earlier studies showing the positive impact of order processing on performance. For example, Sandar (2024) found a strong positive link between order processing and firm performance at a food processing factory in Myanmar. Similarly, Mpuon et al. (2023) observed comparable positive effects among Nigerian small and medium enterprises. Oteki et al. (2018) also reported that electronic order processing significantly improved supply chain performance in sugar companies in Kenya. Although these studies used different methods, while the current study applies PLS-SEM, the consistent findings across various settings highlight the crucial role of efficient order processing in enhancing organizational performance.

4.2. Information Flow and Performance of Jumia in Abuja, FCT

The second objective examined the effect of information flow on Jumia's performance, revealing a significant negative relationship. This unexpected result suggests that excessive or poorly structured information flow may cause inefficiencies such as information overload, decision paralysis, or bottlenecks. Jumia should therefore prioritize improving information quality, relevance, and timeliness over simply increasing volume. It indicates that information flow exerted a statistically significant but negative impact on Jumia's performance in Abuja, which challenges the common expectation that enhanced information exchange improves organizational outcomes. This unexpected result may stem from issues such as information overload and ineffective communication systems that generate delays, confusion, and operational inefficiencies. It underscores that, in the context of Jumia's logistics operations, the manner in which information is managed, rather than volume or speed alone, is critical for enabling performance gains. Immature IT infrastructure and fragmented reporting mechanisms appear to contribute to these adverse effects, suggesting that poorly optimized information flow can hinder rather than help. Therefore, refining information management processes by strengthening filtering methods, clarifying reporting lines, and enhancing employee capacity for handling information represents a vital opportunity for improving logistics performance. These findings highlight the importance of adapting information systems to the specific organizational and regional environment to fully realize their potential benefits in emerging e-commerce markets.

This contrasts previous findings: Ganiyu and Sulaiman (2024) reported a strong positive link between information flow management and performance in Nigerian beverage firms; Umutoni and Akumuntu (2024) found information management positively affected supply chain performance in Rwanda's energy sector; and Adeitan et al. (2021) identified benefits of effective information flow in Nigerian logistics. The difference suggests Jumia's

operational e-commerce context in Abuja faces unique information flow challenges, such as overload or poor processing efficiency, not necessarily present in other sectors.

5. CONCLUSION AND RECOMMENDATIONS

This study found that order processing positively and significantly influences Jumia's performance ($\beta = 0.427$, $t = 4.853$, $p < 0.001$) with a medium effect size ($f^2 = 0.215$), confirming its critical role in e-commerce success. Conversely, information flow negatively and significantly affects performance ($\beta = -0.312$, $t = 3.746$, $p = 0.001$) with a moderate negative effect ($f^2 = 0.168$), likely due to inefficiencies such as information overload or poor data quality. Together, these factors explain about 38.7% of performance variance ($R^2 = 0.387$), highlighting logistics management's significant but partial role in overall performance. However, the study has some limitations to consider. First, it only examined one city, Abuja, so the results might not be applicable to other locations with different e-commerce environments. Second, the focus was solely on a single company, Jumia, which means the findings may not be representative of other e-commerce businesses. Future research could include additional regions and various types of firms to provide a more comprehensive understanding. Additionally, incorporating factors such as infrastructure, technology adoption, customer habits, and competitive dynamics could enhance the explanation of e-commerce performance in emerging markets like Nigeria.

5.1. Policy Suggestion

The study found that efficient order processing has a strong positive impact on Jumia's e-commerce performance in Abuja, driving customer satisfaction and repeat purchases. Conversely, information flow exhibited a significant negative effect, suggesting that excessive or poorly managed information can hinder operational efficiency. These results highlight the crucial role of streamlined order management and the need for effective information filtering and communication structures. For managers, investing in advanced order processing systems, optimizing warehouse operations, and training staff are key strategies to boost performance. Additionally, establishing clearer reporting lines and robust information management mechanisms is essential to prevent information overload and enhance decision-making. Implementing these improvements can strengthen Jumia's competitive position and improve customer experience in Nigeria's evolving e-commerce market.

Based on these findings, two Key recommendations are made.

i. Jumia should upgrade order management systems, optimize warehouse processes, and train staff in order processing to boost customer satisfaction and market position.
ii. Jumia should implement advanced information filtering and prioritization mechanisms, create clearer information hierarchies, streamline reporting, and train staff in effective information processing to reduce overload and improve decision-making.

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Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
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