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ENHANCING OPERATIONAL PERFORMANCE & CUSTOMER SATISFACTION THROUGH LOGISTICS SERVICE QUALITY, INFORMATION SHARING, AND TECHNOLOGY IN WEST AFRICAN AIR CARGO OPERATIONS

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KEYWORDS

Air Cargo Logistics, Logistics Service Quality, Information Sharing, Technological Innovation, Customer Satisfaction

ABSTRACT

Air cargo logistics plays a vital role in trade and regional integration in West Africa, but the performance is limited by low service quality, ineffective data exchange, and low technology adoption. This paper has explored the role of logistics service quality, information sharing & technological innovation in determining the operational performance and customer satisfaction in major airports in West Africa. A cross-sectional survey was conducted with 400 logistics professionals across Lagos, Accra, and Abidjan. Data were analyzed using the structural equation modelling after confirming reliability (Cronbach's α = 0.79–0.88; CR = 0.83–0.90) and validity (AVE > 0.50). The model showed good fit (CFI = 0.958, RMSEA = 0.056). Results revealed that logistics service quality significantly improved operational performance, while information sharing had a stronger effect. Technological innovation enhanced operational outcomes and mediated the impact of information sharing. Operational performance strongly predicted customer satisfaction, with evidence of feedback from satisfied clients to efficiency. The research concluded that performance & customer experience are driven by service quality, data sharing & innovation. It recommends that investing in quality standards, integrated communication platforms and modern technologies, and ongoing monitoring of customer feedback to maintain operational excellence and loyalty.

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INTRODUCTION

Air cargo is a crucial component of international trade and regional development because it allows high-value goods to be transported across borders and economic zones in a short period (Kuteyi & Winkler, 2022). In most developing areas, especially West Africa, the logistics service providers are under pressure to enhance quality and efficiency of their operations to remain competitive in rapidly evolving global market (Gupta, Singh, Mathiyazhagan, Suri & Dwivedi, 2022). Nevertheless, there are still a number of challenges that air cargo sector in West Africa is grappling which includes infrastructural shortages, high operational expenses, and disjointed systems. Such constraints have continued to impede performance of operations and customer satisfaction in the air freight hubs in the region (Sumbal, Ahmed, Shahzeb & Chan, 2023). The challenges pose critical questions on how operations of logistics can be enhanced to guarantee better service delivery, in a setting where efficient logistics is vital driver of regional trade and integration.

Besides, an emerging body of literature demonstrates that logistics systems such as air cargo require a high level of logistics service quality and efficient information sharing to deliver good operational performance and customer retention (Mumin, 2025; Jum, 2025). The quality of logistics services, including such critical aspects such as delivery reliability, order accuracy and responsiveness, has been associated with enhanced efficiency and customer loyalty, whereas information sharing enhances coordination, transparency, timely decision-making throughout the supply chain (Baah, Agyeman, Acquah, Mensah, Afum, Issau & Faibil, 2021). Nevertheless, gaps in the application or measurement of these factors in West African air cargo environment, where logistics systems are less integrated than in more mature environments, still exist. In this respect, issue is not just about the importance of service quality & communication recognition but also about the possibility to find practical solutions on how to transform these abilities into actual performance increases in region with immature infrastructure and poor coordination. The other significant issue is low speed of technological adaptation in air cargo logistics in the West Africa.

Although most logistics providers globally are investing in new technologies like automation, cargo tracking systems, and electronic documentation, some airports in the region still rely on old manual operations & fragmented systems (Caliskan, Eryilmaz & Ozturkoglu, 2025; Sumbal et al., 2023; Oriekhoe, Ashiwaju, Ihemereze, Ikwue & Udeh, 2023). Weak digital infrastructure and absence of real-time data exchange are still decreasing reliability of services and leading to unnecessary issues such as late deliveries, lost packages, and negative customer reviews (Kern, 2021). Whereas other regions is able to utilize the technology to make their logistics operations more efficient and provide quality service uniformly, West African airports have yet to fully realize the potential of innovation to address these historical inefficiencies. This is especially disturbing, because the asymmetrical use of the available technologies is increasing gap amid customer expectations and the capabilities of the logistics system, which in turn is eroding the competitive position of air cargo market in region. Considering these problems, there is need to examine how logistics service quality, information sharing, and technological innovation can be integrated to enhance operational performance and satisfaction in West African air cargo logistics.

Previous research has revealed that the enhancement of service delivery and communication channels can contribute to more efficient logistics systems, and innovation can improve not only speed and accuracy but also ability to respond to customer needs in real-time (Mumin et al. 2025; Khan et., 2022). Nevertheless, interaction between these factors in the specific setting of the West African airports is poorly recorded. The other significant issue is the low speed of technological adaptation in air cargo logistics in West Africa. Empirical evidence that exactly looks at the impact of logistics capabilities and innovation on performance outcomes and client satisfaction in the air freight industry of the region is scarce. Thus, this study aims to fill that gap by examining the effects of logistics service quality and information sharing on operational performance, role of technological innovation in enhancing these effects, and how enhanced performance can be used to produce better customer experiences in the chosen West African airports.

LITERATURE REVIEW

Logistics service quality (LSQ) explains how well providers meet customer needs in moving and handling freight, with attention to timeliness, accuracy, responsiveness, and reliability. In air cargo, where speed and precision are central, strong service quality reduces delays, builds confidence, and strengthens competitiveness, while clear standards, trained staff, and effective tracking systems remain essential to sustaining quality (Singh et al., 2022). Still, Information sharing (IS) complements this by ensuring smooth communication between airlines, freight forwarders, ground handlers, and customs so that the coordination improves and uncertainty declines. Real-time tracking and integrated data platforms allow actors to anticipate problems and respond quickly, which enhances agility and operational consistency, whereas fragmented flows tend to produce delays and errors that weaken logistics outcomes (Le et al., 2021;). Moreover, the technological innovation (TI) connects these two capabilities by supplying tools that make operations faster and more transparent: automation, cargo management platforms, electronic air waybills, IoT-enabled sensors reduce manual effort and provide instant updates on shipment status, yet the value of such technology depends on organisational readiness and staff skills.

From the resource-based view, the innovation is a strategic asset that strengthens information processing and creates an advantage that competitors find hard to imitate (Khan et al., 2022). When service quality, information sharing, and innovation are aligned, they form a platform for sustained performance in cargo logistics. The operational performance (OP) refers to the effectiveness with which logistics processes achieve speed, reliability, and cost control; in air cargo this means on-time delivery, rapid processing, and efficient use of capacity. High OP relies not only on equipment and infrastructure but also on coordination and well-trained staff, while technology enhances tracking, routing, and error reduction (Abdallah, Alhyari, & Alfar, 2023). Because OP determines how reliably customers receive goods, it acts as bridge between internal capabilities and external outcomes, linking LSQ, IS, and TI to customer satisfaction. Satisfaction itself reflects how clients judge delivery speed, the cargo safety and transparency. Customers value clear communication and dependable tracking alongside punctual delivery, and those who perceive steady reliability are more likely to return and recommend services, making satisfaction both an immediate objective and a signal of system health (Gupta et al., 2023).

Furthermore, there are various empirical studies relating to this study, research consistently finds that high LSQ, expressed through accurate and timely deliveries, responsive support, and disciplined processes, reduces delays and losses, improving productivity and efficiency (Singh et al., 2022). The training, clear procedures, and suitable technology enhance this effect, while the poor LSQ undermines operations through damaged or mislaid freight and resource waste (Abdul-Mumin et al., 2025). A reciprocal link also appears: efficient operations support further service quality, creating a reinforcing cycle (Abdallah, Alfar, & Alhyari, 2021). Evidence on IS mirrors this picture. The accurate and timely exchange of data between logistics actors synchronizes activities and allows better planning; studies show that real-time coordination reduces clearance times and supports forecasting across sectors from the pharmaceuticals to manufacturing (Birhanu et al., 2022; Sundram et al., 2020). Where information is incomplete or delayed, performance falters, confirming data integration is indispensable to efficient cargo networks. Moreover, the contribution of TI is clearest when examined alongside IS. Innovation sharpens value of information by enabling rapid processing, analytics, and automated decision support.

It exposes weak areas that improved technology can solve, encouraging continuous refinement of operations (Moldabekova et al., 2021). Evidence from supply chains shows that innovation mediates link between collaboration and performance, and similar logic applies to air cargo: data may be available, but gains remain limited without systems able to interpret and act on it (Wang et al., 2020). Thus, TI amplifies the benefits of LSQ and IS, turning raw capacity into measurable efficiency. The quality of logistics services, including such critical aspects such as delivery reliability, order accuracy responsiveness for realizing diverse outcomes. Meanwhile, operational performance is a proven determinant of customer satisfaction. Studies associate quick delivery, error-free handling & efficient documentation with positive client experiences and retention (Hong et al., 2023; Johnson et al., 2020). Delays or routing failures reduce trust, particularly for the time-sensitive or high-value shipments. Evidence from the African logistics markets shows that the stronger performance improves loyalty and business growth (Okafor & Adebayo, 2019).

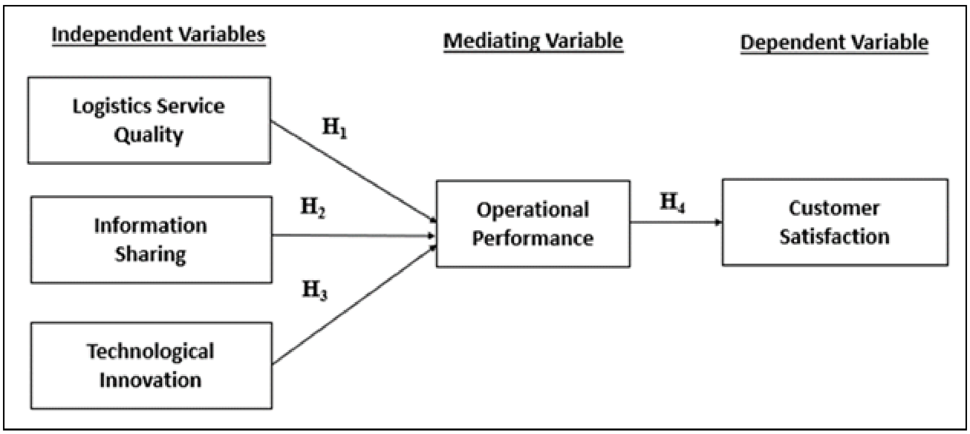
While LSQ can influence satisfaction directly, most research suggests its impact is mainly indirect through OP: service promises raise expectations, it is reliable execution that sustains confidence (Gupta et al., 2022). In business-to-business cargo, precision and reliability matter more than rhetoric, making OP central channel linking internal capabilities to client outcomes. Bringing these strands together, the literature indicates that LSQ and IS form the foundation of efficient air cargo logistics, TI enhances their value, OP converts them into tangible results, and CS reflects how users experience those results. Training, clear procedures, suitable technology enhance this effect, while poor LSQ undermines operations through the damaged or mislaid freight and resource waste in different circumstances. Few studies, however, examine this full chain within West African airports, were fragmented infrastructure and uneven technology adoption complicate service delivery. Understanding how these factors interact in that setting is crucial for policy and managerial strategies aimed at closing service gaps and improving competitiveness.

Conceptual Framework

The conceptual framework is presented in Figure 1. It illustrates how independent variables (logistics service quality, information sharing, and technological innovation) shape operational performance, then drives customer satisfaction. Logistics service quality improves reliability and delivery accuracy, while information sharing supports coordination and problem solving; technological innovation supports by automation & visibility. Operational performance serves as bridge amid these internal capabilities and customer outcomes, highlighting the importance of efficient processes in sustaining loyalty and competitiveness. The hypotheses are stated as follows:

H1: The Logistics service quality has a significant positive effect on operational performance.
H2: The Information sharing has a significant positive effect on the operational performance.
H3: The Technological innovation mediates the relationship between information sharing OP.
H4: The Operational performance has significant positive effect on the customer satisfactions.

Figure 1
Conceptual SEM Framework



RESEARCH METHODOLOGY

This study employed quantitative cross-sectional survey research design. This research design is effective in examining relationships among variables at a single point in time across a large population (Creswell & Inoue, 2025). The study was carried out in three top airports in West Africa: Muritala Muhamed International airport, Lagos State, Nigeria, Kotoka International Airport, Accra, Ghana and Félix Houphouët Boigny International Airport, Abidjan. Multi-stage sampling techniques (stratified and random sampling techniques) were used to selected 400 logistics professionals which include: cargo handlers, freight forwarders, customs officers across these selected airports. Data were sourced through primary source using structured questionnaire. Data were analyzed using descriptive statistics and Structural Equation Model (SEM). Reliability test for model was carried out using Cronbach Alpha, Composite Reliability (CR), Average Variance Extracted while the validity test was carried out using Fornell- Larcker

Criterion. The criterion was used to confirm discriminant validity, ensuring that each construct is distinct from others (Hilkenmeier et al. 2020). The analysis was carried out using both AMOS and SPSS.

FINDINGS OF STUDY

The socio-economic characteristics of respondents is presented in Table 1. The finding shows 62% of the respondents are male while the remaining 38% are female. Most of the respondents are between 26 to 35 years old, making up 40%, followed by 28% of respondents who are amid 36 - 45 years of age. Only 14% are 46 years and above, and 18% are between 18 -25 years of age. Looking at their roles in organization, 29% work as operations staff, 25% are cargo handlers, 22% are managers, and only 16% are logistics coordinators. A smaller group of 8% are working in other areas. In terms of experience, largest group have 4 to 6 years of work experience (35%), followed by over 7 years (34%). Only 7% have less than 1 year of experience. Still, respondents are from three West African airports located in Lagos, Nigeria, Accra, Ghana & Abidjan, Côte d'Ivoire.

Table 1

Socio-Demographic Characteristics of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	248	62.0
	Female	152	38.0
Age	18–25	72	18.0
	26–35	160	40.0
	36–45	112	28.0
	46 and above	56	14.0
Position in Organization	Operations Staff	116	29.0
	Manager	88	22.0
	Logistics Coordinator	64	16.0
	Cargo Handler	100	25.0
	Others	32	8.0
Years of Experience	Less than 1 year	28	7.0
	1–3 years	96	24.0
	4–6 years	140	35.0
	7 years and above	136	34.0
Airport Base	Lagos	142	35.5
	Accra	129	32.3
	Abidjan	129	32.3
Total		400	100.0

Source: Field Survey (2025)

Reliability Tests

The Cronbach Alpha, Composite Reliability (CR), Average Variance Extracted (AVE) results is presented in Table 2 that test reliability of model. The finding confirmed that all measurement scales show high internal consistency and convergent validity. The Cronbach Alpha values were between 0.79 and 0.88 which is above the minimum of 0.70 as recommended by Nunnally and Bernstein (1994) which indicates that each set of items are reliable in measuring one latent construct. The values of CR were above the threshold of 0.70 (Hair et al. 2020), with the highest value of 0.90 in the operational performance. This implies that there is a high level of shared variance in items in each construct. Moreover, all the values of Average Variance Extracted (AVE) were higher than 0.50 threshold (Fornell & Larcker, 1981), with Customer Satisfaction and Operational Performance scoring 0.59 and 0.61 respectively. This implies that construct explains over 50 percent of the variance in indicators, which establishes convergent validity (Black & Babin, 2019). This finding is essential to this research because it means that such items as LSQ4 and OP2, capture timeliness and cargo handling efficiency, do indeed capture what they are supposed to capture in theory, and therefore, relationships tested in the SEM are more valid.

Table 2
Reliability Tests

Construct	Item	SL	CA	CR	AVE
Logistics Service Quality (LSQ)	LSQ1	0.72	0.84	0.87	0.58
	LSQ2	0.74			
	LSQ3	0.76			
	LSQ4	0.80			
	LSQ5	0.73			
Information Sharing (IS)	IS1	0.69	0.81	0.85	0.54
	IS2	0.72			
	IS3	0.71			
	IS4	0.77			
	IS5	0.75			
Technological Innovation (TI)	TI1	0.70	0.79	0.83	0.56
	TI2	0.68			
	TI3	0.72			
	TI4	0.75			
	TI5	0.77			
Operational Performance (OP)	OP1	0.78	0.88	0.90	0.61
	OP2	0.81			
	OP3	0.79			
	OP4	0.84			
	OP5	0.80			
Customer Satisfaction (CS)	CS1	0.74	0.86	0.89	0.59
	CS2	0.78			
	CS3	0.80			
	CS4	0.81			
	CS5	0.77			

Validity Tests for Model

The validity test was carried out using Fornell-Larcker Criterion and the result is presented in Table 3. The Fornell–Larcker results show that the square roots of AVE values are higher than correlations amid constructs, confirming that each variable is distinct. For example, operational performance (0.78) exceeds its correlations with Logistics Service Quality (0.63), Technological Innovation (0.56), while the Customer Satisfaction (0.77) is greater than its links with all other constructs. These findings support discriminant validity and justify testing the structural paths with SEM.

Table 3

Fornell-Larcker Criterion Validity Test

Construct	LSQ	IS	TI	OP	CS
Logistics Service Quality (LSQ)	0.76				
Information Sharing (IS)	0.58	0.73			
Technological Innovation (TI)	0.51	0.61	0.75		
Operational Performance (OP)	0.63	0.59	0.56	0.78	
Customer Satisfaction (CS)	0.49	0.52	0.50	0.65	0.77

Model Fit Indices

The model fit indices result is presented in Table 4, it indicates that the model is fit statistically and theoretically. Ratio of chi-square/degrees of freedom (CMIN/DF = 2.11) is less than the suggested value of 3.0, which shows that model and data are aligned well, even still chi- square to sample size (Schuberth, 2021; Sathyanarayana & Mohanasundaram, 2024). The absolute fit indices like GFI (0.921) and AGFI (0.901) are greater than 0.90, indicating that model explains a substantial proportion of variance and error (Byrne, 2016; Keith, 2019). RMR of 0.031, RMSEA of 0.056, PCLOSE of 0.072, are within acceptable limits, indicating low degree of approximation error (Ximenez et al. 2022). Besides, the fit indices support this stand: CFI (0.958), NFI (0.932), and TLI (0.944) which are above 0.90, indicating that the tested hypotheses are significant. The sample size is adequate as indicated by the Hoelter critical N (210). The model is accurate as parsimony-adjusted indices likewise the AIC (720.411) and ECVI (1.604) suggest (Schumacker & Lomax, 2016).

Table 4

Model Fit Indices Summary

Fit Index	Value	Recommended Threshold
CMIN/DF (Chi-square/df)	2.11	≤ 3.00 = acceptable fit
GFI (Goodness-of-Fit Index)	0.921	≥ 0.90 = good fit
AGFI (Adjusted GFI)	0.901	≥ 0.90 = acceptable fit
RMR (Root Mean Square Residual)	0.031	≤ 0.05 = good fit
NFI (Normed Fit Index)	0.932	≥ 0.90 = good fit
CFI (Comparative Fit Index)	0.958	≥ 0.90 = good fit
TLI (Tucker Lewis Index)	0.944	≥ 0.90 = good fit
RMSEA (Root Mean Square Error of Approximation)	0.056	≤ 0.06 = good fit
PCLOSE	0.072	≥ 0.05 = good fit
AIC (Akaike Information Criterion)	720.411	Lower = model comparison
ECVI (Expected Cross-Validation Index)	1.604	Lower = better
Hoelter .05	210	≥ 200 = adequate sample size

Structural Path Estimates & Hypothesis Testing

As shown in path diagram (Figure 2) and Table 5, All hypotheses were accepted because their estimates were positive and significant at $p < 0.001$. H1 showed that logistics service quality improved performance ($\beta = 0.341$). H2 confirmed that information sharing strongly enhanced operational performance ($\beta = 0.752$). H3 indicated that technological innovation significantly mediated link amid information and performance ($\beta = 0.533$). Finally, customer satisfaction had positive effect on operational performance ($\beta = 1.114$), supporting feedback relationship in the model.

Figure 1

Path Diagram (Source: AMOS Output)

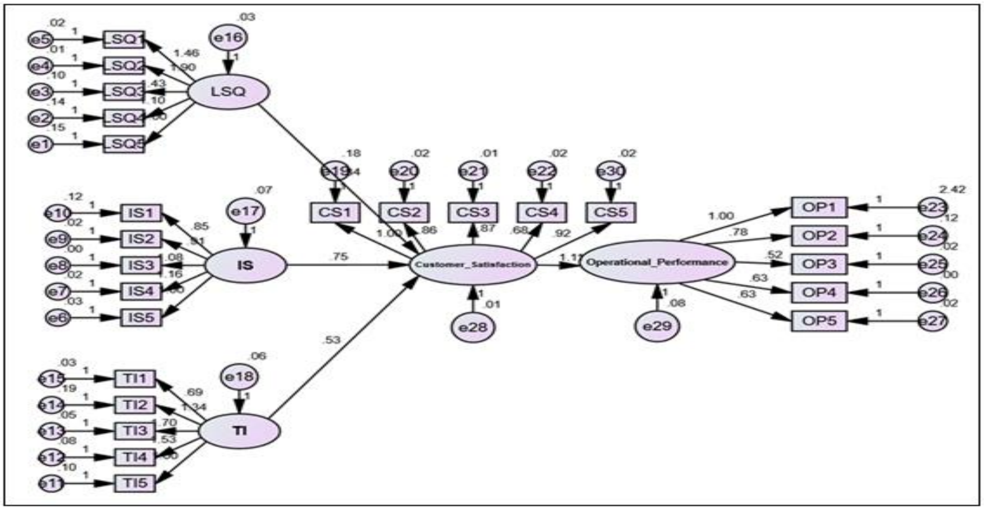


Table 5

Structural Path Estimates and Hypotheses Testing

Hypotheses	Estimate (β)	S.E.	C.R.	PV	Decision
H1: Logistics service quality has a significant effect on operational performance.	0.341	0.056	6.063	***	Supported
H2: Information sharing has a significant effect on operational performance.	0.752	0.071	10.636	***	Supported
H3: Technological innovation has a significant effect on operational performance.	0.533	0.063	8.477	***	Supported
H4: Operational performance has a significant effect on customer satisfaction.	1.114	0.244	4.558	***	Supported

***$p < 0.001$ (statistically significant)

DISCUSSION

The findings confirmed that the model of study was both reliable and valid. Cronbach's alpha, composite reliability, and AVE values all exceeded recommended thresholds, showing that each construct was internally consistent and captured more than half of variance in indicators (Hair et al., 2020; Fornell & Larcker, 1981). Discriminant validity was also achieved, as the square roots of AVE values were higher than inter-construct correlation, meaning that logistics service quality, information sharing, technological innovation, operational performance and customer satisfaction measured distinct concepts. Model fit indices (CMIN/DF, GFI, AGFI, CFI, TLI, RMSEA) were within acceptable limits, supporting the adequacy of the structural model (Byrne, 2016; Schumacker & Lomax, 2016). Thus, all hypotheses were supported, showing clear links among variables. Logistics service quality had significant positive effect upon operational performance, confirming that reliable and timely services enhance efficiency (Baah et al., 2021; Singh et al., 2022). Information sharing improved operational performance, highlighting value of real-time communication in reducing delays, improving planning. Technological innovation strengthened these relationships, acting as mediator amid information sharing and operational outcomes, as noted by Khan et al. (2022). performance, in turn, had a strong positive impact on customer satisfaction, aligning with evidence that efficient logistics systems increase client confidence & loyalty (Johnson et al., 2020). Positive feedback from satisfaction to performance suggests that responsive service creates a cycle of improvement, consistent with Daugherty et al. (2020).

CONCLUSION

The study shows that logistics service quality, information sharing & technological innovation are key drivers of operational performance in West African air cargo logistics. Performance not only mediates their effects but also directly supports customer satisfaction, while feedback from satisfied clients reinforces operational standards. Investing in service quality, clear data exchange, modern technology is thus essential for improving efficiency & sustaining customer loyalty in regional air cargo operations. Based on findings, several practical steps are essential and optional for strengthening air cargo logistics operation in West Africa: Air cargo operators should strengthen delivery accuracy, timeliness, responsiveness through clear standards, staff training, and consistent monitoring to enhance operational performance. Air cargo operators should develop integrated systems for real-time communication among airlines, handlers, and customs to improve coordination and reduce delays in operations. Air cargo operators should invest in automation, tracking tools, and digital documentation to support information use and drive higher operational efficiency. The air cargo operators should maintain efficient processes & use customer feedback to sustain high service quality and continuous improvement in cargo operations.

Policy Implication

Various policies can be implemented based on findings of this research: government should implement standards that will ensure quality in logistics services and advance digitalization of air cargo activities. Activities like cargo tracking, automation and real-time data sharing should be supported by government policies. Besides, regulators should insist on customer feedback mechanisms to track satisfaction and inform performance enhancement. Equally, there should be regional cooperation among the west African states to stimulate the operations of air cargo logistics among the states in this region. Hence, implementing these policies will not increase operational efficiency, customer satisfaction and competitiveness of air cargo logistics industry in West Africa.

REFERENCES

Abdallah, A. B., Alfar, N. A., & Alhyari, S. (2021). Effect of supply chain quality management on supply chain performance: the indirect roles of supply chain agility and innovation. *International Journal of Physical Distribution & Logistics Management, 51*(7), 785–812.

Abdallah, A. B., Alhyari, S., & Alfar, N. A. (2023). Exploring the impact of supply chain quality management on market performance: the mediating roles of supply chain integration and operational performance. *Business Process Management Journal*, *29*(4), 1159-1183.

Baah, C., Agyeman, D. O., Acquah, I. S. K., Mensah, Y., Afum, E., Issau, K., & Faibil, D. (2021). Effect of information sharing in supply chains: understanding the roles of supply chain visibility, agility, and collaboration on supply chain performance. *Benchmarking: An International Journal, 28*(6), 1945–1975.

Birhanu, Y., Gizaw, T., Teshome, D., Boche, B., & Gudeta, T. (2022). The mediating effect of information sharing on pharmaceutical supply chain integration and operational performance in Ethiopia: an analytical cross-sectional study. *Journal of Pharmaceutical Policy and Practice, 15*(44).

Black, W., & Babin, B. J. (2019). Multivariate data analysis: Its approach, evolution, and impact. In *The great facilitator: Reflections on the contributions of Joseph F. Hair, Jr. to marketing and business research* (pp. 121-130). Cham: Springer International Publishing.

Byrne, B. M. (2016). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming* (3rd ed.). Routledge.

Caliskan, A., Eryilmaz, S., & Ozturkoglu, Y. (2025). Investigating the effects of barriers and challenges on Logistics 4.0 in the era of evolving digital technology. *Journal of Modelling in Management*, *20*(3), 949-973.

Creswell, J. W., & Inoue, M. (2025). A process for conducting mixed methods data analysis. *Journal of General and Family Medicine*, *26*(1), 4-11.

Daugherty, P. J., Chen, H., & Ferrin, B. G. (2020). Organizational structure and logistics service innovation: A contingency approach. *International Journal of Physical Distribution & Logistics Management*, 50(3), 345–362.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, *18*(1), 39–50.

Gupta, A., Singh, R. K., Mathiyazhagan, K., Suri, P. K., & Dwivedi, Y. K. (2023). Exploring relationships between service quality dimensions and customers satisfaction: empirical study in context to Indian logistics service providers. *The international Journal of logistics management*, *34*(6), 1858-1889.

Gupta, A., Singh, R. K., Mathiyazhagan, K.,., & Dwivedi, Y. K. (2022). Exploring relationships between service quality dimensions and customer satisfaction: Empirical study in context to Indian logistics service providers. *International Journal of Logistics Management*. (Advance online publication).

Hair, F., Howard, M. C., & Nitzl, C. (2020). Assessing measurement model quality in PLS-SEM using confirmatory composite analysis. *Journal of business research*, *109*, 101-110.

Hilkenmeier, F., Bohndick, C., Bohndick, T., & Hilkenmeier, J. (2020). Assessing distinctiveness in multidimensional instruments without access to raw data–a manifest Fornell-Larcker criterion. *Frontiers in psychology*, *11*, 223.

Keith, T. Z. (2019). *Multiple regression and beyond: An introduction to multiple regression and structural equation modeling*. Routledge.

Kern, J. (2021). The digital transformation of logistics: A review about technologies and their implementation status. *The digital transformation of logistics: Demystifying impacts of the fourth industrial revolution*, 361-403.

Khan, M. T., Idrees, M. D., Rauf, M., Sami, A., Ansari, A., & Jamil, A. (2022). Green supply chain management practices' impact on operational performance with the mediation of technological innovation. *Sustainability, 14*(6), 3362.

Kuteyi, D., & Winkler, H. (2022). Logistics challenges in Sub-Saharan Africa and opportunities for digitalization. *Sustainability, 14*(4), 2399.

Le, C. T. D., Pakurár, M., Kun, I. A., & Oláh, J. (2021). The impact of factors on information sharing: An application of meta-analysis. *PLoS One, 16*(12), e0261646.

Moldabekova, A., Philipp, R., & Alikozhayev, B. (2021). Digital technologies for improving logistics performance of countries. *Transport and Telecommunication*, *22*(2), 207-216.

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric Theory* (3rd ed.). McGraw-Hill.

Okafor, C. J., & Adebayo, R. A. (2019). Technological innovations and logistics efficiency in Nigeria. *African Journal of Logistics & Supply Chain, 5*(2), 56–68.

Oriekhoe, O. I., Ashiwaju, B. I., Ihemereze, K. C., Ikwue, U., & Udeh, C. A. (2023). Review of technological advancement in food supply chain management: comparison between USA and Africa. *World Journal of Advanced Research and Reviews*, *20*(3), 1681-1693.

Sathyanarayana, S., & Mohanasundaram, T. (2024). Fit indices in structural equation modeling and confirmatory factor analysis: reporting guidelines. *Asian Journal of Economics, Business and Accounting*, *24*(7), 561-577.

Schuberth, F. (2021). Confirmatory composite analysis using partial least squares: Setting the record straight. *Review of Managerial Science*, *15*(5), 1311-1345.

Schumacker, E., & Lomax, G. (2016). A beginner's guide to structural equation modelling. 4th edtn. *London: Routledge New York, NY*.

Singh, S. P., Adhikari, A., Majumdar, A., & Bisi, A. (2022). Does service quality influence operational and financial performance of third-party logistics service providers? A mixed MCDM–text mining-based investigation. *Transportation Research Part E: Logistics and Transportation Review, 157*, 102558.

Sumbal, M. S., Ahmed, W., Shahzeb, H., & Chan, F. (2023). Sustainable technology strategies for transportation logistics challenges: implementation feasibilitystudy. *Sustainability*, *15*(21), 15224.

Sundram, V. P. K., Chhetri, P., & Bahrin, A. S. (2020). Consequences of information technology, information sharing and supply chain integration towards supply chain performance and firm performance. *Journal of International Logistics and Trade, 18*(1), 15–31.

Wang, X., Yu, Y., & Frazelle, E. (2020). Predictive analytics in logistics: A case study approach. *Journal of Business Logistics, 41*(2), 132–149.