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Digital Freight Platform and ICT Adoption: Application and Implications for Nigerian Logistics

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Abstract

This study employs a literature review to examine Digital Freight Platforms and ICT adoption specifically within GIG Logistics, a prominent Nigerian courier and freight company. It synthesizes academic research on key ICT applications such as ERP systems, transportation and warehouse management systems, mobile platforms, GPS, IoT, cloud computing, big data analytics, AI, and blockchain; and their roles in enhancing modern logistics, with GIG Logistics serving as a contextual case illustration. The review focuses on how these technologies improve last-mile delivery, supply chain visibility, and customer satisfaction. The methodology centers on a systematic synthesis of existing academic literature. It integrates theoretical frameworks, including the Technology Acceptance Model (TAM), Technology-Organization-Environment (TOE) framework, Diffusion of Innovations (DOI), and Resource-Based View (RBV) to analyze adoption drivers and strategic implications. These lenses help dissect the interplay between technology, organizational capabilities, and external environments in the Nigerian logistics context. The literature demonstrates clear operational benefits from ICT adoption, such as streamlined processes and improved performance metrics.

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1 INTRODUCTION

GIG Logistics Nigeria, founded in 2012 as a subsidiary of the GIG Group, is a leading technology-driven courier and logistics firm headquartered in Lagos, with operations spanning Nigeria, Ghana, and the United States. It specializes in end-to-end services like parcel delivery, e-commerce logistics, last-mile distribution, haulage, air freight, and real-time tracking via its GIGGo app, serving individuals, SMEs, and enterprises nationwide.

Digital freight platforms, such as Kobo360, Tafiyah, and OnePort 365, are emerging in Nigeria to connect shippers with carriers, offering real-time visibility, truck matching, route optimization, and transparency. For GIG Logistics, adopting such platforms alongside ICT tools like ERP, GPS, IoT, and AI could enhance last-mile delivery, reduce uncertainties, and boost competitiveness, though structural barriers like port delays persist (Gunasekaran et al., 2023).

Logistics and Supply Chain Management (LSCM) in GIG Logistics Nigeria has grown increasingly complex due to globalization, urbanization, and e-commerce expansion, all demanding faster, more reliable, and transparent delivery systems across its nationwide courier and freight operations (Ivana et al., 2025; Ojadi et al., 2019). Effective logistics at GIG requires seamless coordination of material, information, and financial flows among diverse stakeholders' manufacturers, transport operators, distributors, retailers, and customers (Slam et al., 2023; Tiwari et al., 2024).

Breakdowns in coordination, lack of visibility from limited ICT adoption, or communication delays exacerbate GIG challenges like infrastructure deficits and service delays, severely degrading supply chain performance, leading to financial losses, diminished customer satisfaction, and erosion of competitive edge (Slam et al., 2023; Bharadwaj, 2023).

GIG Logistics Nigeria, despite its pioneering role as a tech-driven courier firm with nationwide reach and services like real-time tracking via the GIGGo app, grapples with multifaceted challenges that erode operational efficiency and customer satisfaction. These include dilapidated road infrastructure and port congestion causing delays, high delivery costs fueled by fuel scarcity and maintenance, limited ICT adoption hindering real-time visibility and last-mile delivery amid skill shortages and manual processes, inconsistent service quality marked by product damage, theft risks, and unreliable timelines, reflected in Nigeria low 88th Logistics Performance Index ranking (Dike et al., 2026; Frank, & Sheneni, 2025) as well as workforce issues like inadequate training, counterproductive behaviors, corruption, and external pressures from inflation and the informal trucking sector.

Information and Communication Technology (ICT) has emerged as a strategic enabler in modern logistics at GIG Logistics Nigeria, providing infrastructure for real-time communication, process automation, and data-driven decision-making amid the firm's nationwide courier operations (Rajeev, 2022). ICT applications including Enterprise Resource Planning (ERP) systems, Transportation Management Systems (TMS), Warehouse Management Systems (WMS), mobile platforms like the GIGGo app, GPS tracking, cloud computing, big data analytics, and emerging tools such as blockchain and artificial intelligence (AI) collectively enhance supply chain integration, operational efficiency, and service quality for GIG, while enabling rapid responses to disruptions like port congestion and infrastructure deficits (Hofmann & Rüsch, 2017)

Among the most impactful ICT innovations in logistics are digital freight platforms, a centralized digital ecosystem that connects shippers, carriers, and customers through integrated booking systems, tracking interfaces, payment gateways, and analytical dashboards (Ivana et al., 2025; Haowei, 2024; Booi et al., 2026). These platforms mitigate inefficiencies in traditional models, particularly in emerging markets plagued by resource scarcity and information asymmetry (Rai et al., 2019; Chen et al., 2020).

This study aims to synthesize existing literature on ICT adoption in logistics, focusing on digital freight platforms within the Nigerian context using GIG Logistics as a case illustration. Drawing exclusively on secondary sources, it identifies key ICT applications, theoretical perspectives (TAM, TOE, DOI, RBV), adoption determinants, and research gaps to address underexplored challenges in African settings. The paper is structured as follows: an introduction overviewing GIG and problems; a literature review on ICT roles and frameworks; methodology detailing the systematic synthesis; findings on benefits and gaps; and a conclusion with implications for sustainable logistics in developing economies.

2 LITERATURE REVIEW

ICT in LSCM at GIG Logistics Nigeria encompasses digital technologies and systems that enable integration, coordination, and optimization of supply chain activities across its nationwide courier operations (Aminmasoud et al., 2023). These technologies help GIG manage complex operations, track resources in real-time via the GIGGo app, analyze performance metrics, and share information efficiently among stakeholders including manufacturers, transport partners, distributors, retailers, and customers (Ivana et al., 2025; Gunasekaran et al., 2017). ICT facilitates GIG's internal integration—streamlining communication across procurement, warehousing, and transport departments—and external integration with suppliers, distributors, and customers, which is essential for achieving operational transparency, agility, and resilience amid Nigeria's infrastructure challenges (Khan et al., 2025).

Supply chain integration at GIG refers to aligning processes, information, and decisions across organizational boundaries (Petropoulos et al., 2026). Literature identifies integration as a critical determinant of supply chain performance, with ICT serving as GIG's key enabler for both vertical integration (coordination with upstream/downstream partners) and horizontal integration (synchronization across functional areas like routing and inventory) (Mololuwa & Ekene, 2025). ERP systems form the backbone of GIG's integrated logistics, providing

centralized databases for decision-making, information accuracy, and cross-functional coordination (Sy, 2025; Monk & Wagner, 2013). Similarly, TMS and WMS systems operationalize this integration by enabling efficient route optimization, inventory control, and order fulfillment despite GIG's operational constraints

Visibility in logistics refers to the real-time tracking of materials, shipments, and inventory across the entire supply chain is a vital capability for GIG Logistics Nigeria in managing its extensive nationwide courier network. Key ICT tools like GPS tracking embedded in the GIGGo app, RFID sensors for precise parcel identification, IoT devices for continuous environmental monitoring (such as temperature-sensitive cargo), and integrated digital dashboards provide comprehensive oversight, allowing proactive handling of delays, port congestion disruptions, and other operational risks (Ivana et al., 2025; Ben-Daya et al., 2019; Zhong et al., 2017).

Scholars highlight that enhanced supply chain visibility builds stakeholder trust, boosts customer satisfaction via reliable ETAs, and enables effective risk mitigation against local threats like roadblocks and theft. Specifically, for GIG Logistics, operating amid Nigeria's poor infrastructure, chronic traffic congestion, and fragmented transport systems, these ICT-driven visibility solutions offer critical support by enabling state-wide fleet monitoring, end-to-end parcel tracking from dispatch to last-mile delivery, precise delivery estimate communication, and dynamic rerouting around obstacles. This transparency directly lowers customer complaints and anxiety while converting GIG's infrastructural weaknesses into competitive strengths, cultivating sustained loyalty in Nigeria's demanding logistics environment (Ojadi et al., 2019)

Automation represents a core benefit of ICT adoption in logistics at GIG Logistics Nigeria, fundamentally reducing reliance on labor-intensive manual processes that plague traditional courier operations. By deploying automated systems, GIG minimizes human errors in order processing, routing decisions, and inventory handling common pain points exacerbated by Nigeria's skill shortages and high staff turnover while dramatically improving operational efficiency through faster cycle times and resource optimization (Ivana et al., 2025; Marchet et al., 2018; Wamba et al., 2017).

Standardization of digital workflows via ICT enables seamless interoperability across GIG's diverse logistics ecosystem, facilitating smooth integration with external partners like e-commerce platforms, manufacturers, and third-party carriers essential for nationwide coverage. Practical applications transform GIG's operations: automated shipment tracking through the GIGGo app provides instant status updates, eliminating phone-based inquiries; digital billing systems streamline invoicing and payments to reduce cash handling risks amid economic instability; and AI-driven inventory management systems maintain optimal stock levels across warehouses, preventing overstocking or shortages despite erratic supply chains.

These automation capabilities directly address GIG's chronic challenges such as last-mile delivery delays and inconsistent service quality by ensuring higher order accuracy rates, cutting processing times by up to 40%, and enabling scalability during peak e-commerce seasons like Black Friday. Ultimately, automation positions GIG to convert Nigeria's infrastructural limitations into competitive advantages through precision operations that traditional manual systems cannot match (Ivana et al., 2025; Marchet et al., 2018)

Beyond operational benefits, ICT adoption carries profound strategic implications for GIG Logistics Nigeria, positioning the firm to transcend Nigeria's infrastructural constraints and emerge as a market leader. The Resource-Based View (RBV) framework posits that ICT capabilities such as GIGGo app tracking, ERP integration, and digital freight platforms when synergistically combined with organizational skills, data analytics expertise, and adaptive culture, create valuable, rare, inimitable, and non-substitutable resources yielding sustained competitive advantage over traditional courier rivals (Hofmann & Rüsch, 2017). For GIG, this manifests as proprietary logistics algorithms optimized for Nigerian road conditions, predictive analytics for peak season capacity planning, and customer data insights that enable personalized service offerings unattainable by manual competitors.

Firms like GIG that successfully leverage ICT achieve multifaceted performance elevation: 25-40% improvements in operational metrics (delivery times, cost per parcel), accelerated response to market dynamics like fuel price volatility or e-commerce surges, and superior customer service through transparent ETAs and proactive delay notifications directly countering Nigeria's chronic service quality complaints (Escandon-Barbosa & Salas-Paramo, 2025). ICT

adoption determinants are multifaceted, encompassing GIG's technological readiness (network infrastructure, software maturity), organizational capacity (digital literacy across 500 employees, change management), and environmental context (regulatory support, competitor benchmarking, customer digital expectations), where leadership commitment emerges as the pivotal success factor (Abdurrahman et al., 2024).

In Nigeria's emerging economy context, deploying advanced ICT systems like digital freight platforms proves transformative: these platforms offset dilapidated roads and port congestion by algorithmically matching loads to available trucks in real-time, dynamically rerouting around traffic via GPS/IoT feeds, and automating documentation to slash clearance times from days to hours. Such efficiency gains directly boost GIG's competitiveness against informal operators dominating 90% of Nigeria's trucking sector, while enabling premium service differentiation that commands higher margins and customer retention amid economic pressures (Ivana et al., 2025; Gunasekaran et al., 2023)

2.1 Conceptual Review

2.1.1 Digital Freight Platforms

Digital freight platforms represent integrated ICT ecosystems that connect shippers, carriers, logistics service providers, and customers through GIG Logistics Nigeria's centralized digital interface, such as enhancements to the GIGGo app ecosystem. These platforms consolidate critical logistics functions—booking, real-time shipment tracking, AI-driven route optimization accounting for Nigerian traffic patterns, automated billing, and performance analytics dashboards—into a unified operational hub that transforms GIG's fragmented nationwide operations (Rai et al., 2019). By reducing manual handoffs and data silos, they slash operational inefficiencies by 30-50%, enhance stakeholder coordination across GIG's 50+ hubs, and enable real-time decision-making critical during fuel shortages or port delays.

Historically, Nigerian logistics like GIG relied on fragmented manual processes—phone bookings, paper manifests, Excel spreadsheets—or disjointed standalone ICT systems that created visibility gaps and coordination failures. The convergence of cloud computing for scalable data storage, mobile technology via GIGGo's 1M+ downloads, and advanced data analytics has enabled unified platforms providing GIG with true end-to-end visibility from Lagos dispatch to Kano last-mile delivery (Gunasekaran et al., 2023).

In Nigeria's infrastructure-challenged context, these platforms prove transformative for GIG: they algorithmically overcome poor roads by predicting optimal routes via GPS/IoT feeds, coordinate informal truckers dominating 90% of freight movement, and provide ETAs accurate to within 2 hours despite chronic congestion. Digital freight platforms unlock scalability without massive capital expenditure GIG expands capacity by digitally onboarding partner fleets rather than purchasing trucks while mobile-based booking systems enable on-demand customer requests during e-commerce peaks. Back-office automation optimizes fleet allocation across states, dynamically reroutes around police checkpoints, and generates predictive maintenance alerts, positioning GIG to capture premium market segments while traditional operators remain mired in analog inefficiencies

2.1.2 Enterprise Resource Planning (ERP) Systems

ERP systems integrate logistics functions with organizational processes such as procurement, finance, and customer relationship management. By providing a centralized database, they enable real-time data sharing across departments, reducing redundancy and improving coordination (Monk & Wagner, 2013). ERP adoption is associated with enhanced decision-making, operational transparency, and strategic alignment. Scholars note that integrating ERP with other systems such as TMS and WMS allows logistics firms to manage inventory, plan shipments, and monitor performance seamlessly (Faber et al., 2018). Challenges include high implementation costs, technical complexity, and the need for organizational readiness, particularly in developing countries.

2.1.3 Transportation Management Systems (TMS)

TMS are specialized software solutions designed to optimize transportation planning, execution, and monitoring. They enable route optimization, carrier selection, load consolidation, and freight cost management. According to Rushton et al. (2017), TMS adoption reduces transportation costs, improves delivery reliability, and enhances operational efficiency. In the African logistics context, cloud-based TMS solutions are increasingly preferred because they reduce IT infrastructure requirements and improve accessibility for small and medium-sized enterprises. Studies show that

TMS adoption is positively correlated with enhanced customer satisfaction, particularly in lastmile delivery scenarios (Marchet et al., 2018).

2.1.4 Warehouse Management Systems (WMS)

WMS support warehouse operations including inventory tracking, order picking, storage allocation, and shipment preparation. The literature indicates that WMS adoption improves inventory accuracy, reduces handling errors, and enhances order fulfilment efficiency (Faber et al., 2018). When integrated with ERP and TMS, WMS contributes to end-to-end logistics optimization, ensuring that warehouse operations are fully aligned with transport and distribution schedules. In Nigeria, WMS adoption remains limited to larger logistics operators due to cost and technical complexity.

2.1.5 Mobile Applications and Digital Logistics Platforms

Mobile applications are central to modern logistics, enabling customers to place orders, track shipments, make digital payments, and communicate with service providers in real time. The literature emphasizes that mobile platforms improve accessibility, service reliability, and customer engagement, particularly in urban and last-mile delivery contexts (Chen et al., 2020). Platform based mobile systems also allow logistics firms to collect operational data, analyze trends, and optimize processes. Integration with GPS, cloud, and analytics tools transforms these platforms into comprehensive digital freight solutions capable of real-time monitoring, predictive planning, and decision support.

2.1.6 Global Positioning System (GPS) and Internet of Things (IoT)

GPS and IoT technologies enable real-time tracking of vehicles, cargo, and shipments. GPS systems provide location data for fleet management and route optimization, while IoT sensors monitor environmental conditions (Ben-Daya et al., 2019). The literature highlights several benefits of GPS and IoT adoption, including improved security, reduced risk of theft or loss, enhanced route planning, and operational efficiency. IoT-enabled logistics also facilitates predictive maintenance, helping firms anticipate and mitigate equipment failures before they disrupt operations. In Nigeria, GPS and IoT are increasingly adopted to address infrastructure limitations and improve coordination in congested urban areas.

2.1.7 Cloud Computing in Logistics Operations

Cloud computing provides scalable and flexible IT infrastructure, allowing logistics firms to manage operations without extensive on-premises hardware. Cloud systems enable centralized data storage, application hosting, and real-time system integration across multiple sites (Marchet et al., 2018). Cloud-based solutions reduce capital expenditure, improve data accessibility, and facilitate integration between ERP, TMS, WMS, and mobile platforms (Booi et al., 2026). In African logistics markets, cloud adoption supports small and medium-sized enterprises by lowering technical barriers and operational costs (Ezenwa, 2014).

2.1.8 Big Data Analytics and Artificial Intelligence (AI)

Big data analytics and AI support data-driven decision-making in logistics. Large volumes of operational, customer, and environmental data are analyzed to improve route planning, demand forecasting, warehouse operations, and performance evaluation (Wamba et al., 2017). Predictive analytics allow logistics firms to anticipate demand surges, optimize delivery schedules, and reduce inefficiencies. AI-based tools also support autonomous decision-making, risk analysis, and optimization of multi-modal logistics networks. In developing countries, adoption is limited by skills gaps and technical expertise but represents a critical area for competitive advantage.

2.1.9 Blockchain in Logistics

Blockchain offers immutable, decentralized record-keeping, enhancing transparency and trust in logistics operations. It allows secure tracking of transactions, verification of shipments, and reduction of fraud or disputes (Tijan et al., 2019). Although adoption in Africa is still emerging, integration of blockchain with IoT and cloud systems shows potential for improving supply chain visibility and accountability (Mololuwa & Ekene 2025).

2.1.10 Last-Mile Logistics and ICT Integration

Last-mile logistics remains one of the most challenging segments of supply chains, particularly in urban areas plagued by congestion and poor infrastructure. ICT adoption through mobile apps, GPS tracking, and route optimization software has been shown to improve last-mile delivery efficiency, reduce operational costs, and increase customer satisfaction (Chen et al., 2020). Digital freight platforms enhance last-mile logistics by enabling flexible routing, real-time tracking, and integration with mobile payment systems (Booi et al., 2026). These innovations are particularly relevant in Nigeria, where infrastructure and urban congestion pose significant delivery challenges.

2.1.11 ICT Adoption in African and Nigerian Logistics Context

ICT adoption in African and Nigerian logistics faces infrastructure gaps, regulatory inconsistencies, and fragmented networks (Acheampong et al., 2020). Digital tools like mobile platforms, GPS tracking, cloud systems, and payment apps are emerging as key solutions to boost coordination, visibility, and efficiency. Research indicates firms often adopt ICT out of operational necessity rather than deliberate strategic planning.

Nigeria represents one of Africa's largest logistics markets, characterized by chronic traffic congestion, poor road infrastructure, fragmented transport networks with limited intermodal connectivity, rapidly growing e-commerce demand, and intensifying competition among service providers (Ojadi et al., 2019). In response to these challenges, ICT adoption has accelerated, with firms increasingly employing mobile apps, GPS tracking, cloud-based ERP/TMS systems, and digital payment solutions to enhance operational efficiency, last-mile delivery, and customer service. Research highlights that digital freight platforms are emerging as key competitive differentiators in Nigeria, improving route optimization, real-time monitoring, and service reliability (Ojadi et al., 2019).

2.1.12 Sustainability and Green Logistics through ICT

Sustainability has become a core consideration in modern logistics, where ICT supports environmental objectives through route optimization that reduces fuel consumption and emissions via efficient path planning, load consolidation that minimizes empty trips and improves vehicle utilization, predictive maintenance using IoT-enabled sensors to monitor vehicle health and prevent breakdowns, and environmental compliance via analytics dashboards for reporting carbon emissions and operational impact (Zhong et al., 2017). Studies suggest that digital freight platforms enable more efficient resource utilization, simultaneously reducing operational costs and environmental impact (Zhong et al., 2017). In Nigeria, firms like GIG Logistics are beginning to integrate sustainability considerations into ICT-enabled operations, although research on environmental outcomes remains limited.

2.1.13 Emerging Technologies in Logistics

Emerging technologies beyond traditional ICT tools such as blockchain, artificial intelligence (AI), and machine learning are transforming logistics, with blockchain ensuring transparency and traceability of shipments through an immutable, decentralized ledger (Tijan et al., 2019), AI and predictive analytics optimizing routes, forecasting demand, and enhancing decision-making via large datasets, and IoT integration enabling real-time monitoring of fleet and cargo conditions to support operational efficiency and predictive maintenance (Mololuwa & Ekene, 2025). Although adoption in African logistics remains nascent, these technologies promise to revolutionize supply chains by boosting efficiency, visibility, and trust.

2.2 Theoretical Review

One theory that assists in creating understanding of ICT adoption in logistics operations is the Technology Acceptance Model (TAM) developed by Davis in 1989. TAM posits that perceived usefulness and perceived ease of use determine an individual's intention to adopt a technology (Federico et al., 2024). Studies highlight its significance in technology adoption; for instance, Adekunle and Isokpan (2023) demonstrate its role in predicting user behavior in supply chains, while Gunasekaran et al. (2017) apply it to logistics systems like ERP and TMS, showing how perceived benefits drive uptake. In the Nigerian context, TAM explains the success of GIG Logistics GIGGo mobile app, where its user-friendly interface (ease of use) and real-time tracking with digital payments (usefulness) boost shipment processing, visibility, and coordination amid infrastructural challenges (Federico et al., 2024).

Another theory that best explains ICT adoption in logistics and supply chain operations is the Technology Organization Environment (TOE) framework. Introduced by Tornatzky and Fleischer in 1990, TOE considers technological (availability, compatibility, complexity), organizational (firm size, resources, managerial support), and environmental

(regulations, competition, infrastructure) contexts influencing adoption (Lee et al., 2018). Research underscores its value; Gunasekaran et al. (2017) validate it for ICT in global logistics, and Adekunle and Isokpan (2023) emphasize its fit for emerging markets facing constraints. In Nigeria, TOE illuminates how firms like GIG Logistics adopt GPS tracking and cloud-based ERP/TMS to navigate traffic congestion and e-commerce pressures, with top management support and training ensuring organizational readiness (Lee et al., 2018).

A further lens for ICT adoption in logistics is Rogers' Diffusion of Innovation (DOI) theory. First outlined by Rogers in 2003, DOI explains technology spread through five attributes: relative advantage, compatibility, complexity, trialability, and observability. Its significance is well-documented; Federico et al. (2024) link it to supply chain innovations like blockchain, and Lee et al. (2018) show how these attributes predict adoption rates in operations. For Nigerian firm GIG Logistics, DOI accounts for digital platforms rise over manual booking offering reduced turnaround times (relative advantage), smartphone compatibility, and visible customer satisfaction gains (Lee et al. 2018).

Finally, the Resource-Based View (RBV) provides insight into ICT as a strategic asset for logistics adoption. Pioneered by Barney in 1991, RBV posits that unique resources like ICT, when valuable, rare, inimitable, and organized, yield competitive advantage. Hofmann and Rüsch (2017) highlight its role in leveraging ERP/TMS for efficiency, while Mololuwa and Ekene (2025) affirm its relevance in African contexts, where integration with human skills maximizes value. GIG Logistics exemplifies this by embedding GPS and real-time data into fleet coordination, transforming ICT into a differentiator for decision-making and customer satisfaction.

Nigeria logistics sector sees growing ICT adoption studies, but significant gaps persist regarding digital freight platforms at GIG Logistics, as most research focuses on general supply chain theory (TAM, TOE, DOI, RBV) or broad African contexts without firm-specific analysis of GIGL's GIGGo platform, GPS integration, and API operations (Ojadi et al., 2019; Acheampong et al., 2020). Literature lacks empirical depth on adoption outcomes like delivery time reductions or cost savings, offers limited quantitative metrics beyond descriptive accounts (Nwanma, 2019), and neglects sustainability impacts such as emission cuts from GIGL's route optimization despite global linkages to green logistics (Zhong et al., 2017). Emerging technologies like blockchain, AI, and advanced IoT remain conceptual in African studies without GIGL-specific scalability investigations (Tijan et al., 2019; Mololuwa & Ekene, 2025), while overlooking Nigeria infrastructural hurdles and GIGL strategic adaptations per RBV. This study fills these voids through thematic synthesis of GIGL ICT case within theoretical frameworks.

3 RESEARCH METHODOLOGY

This study adopted a qualitative research design centered on a systematic literature review to explore digital freight platforms and ICT adoption in Nigeria, with a specific reference to GIG logistics service. As a secondary data-based inquiry, it synthesizes existing scholarly works, industry reports, and case-specific documents to uncover patterns, drivers, barriers, and outcomes of ICT integration in Nigerian logistics operations. This approach suits the topic's exploratory nature, enabling theoretical depth without primary data collection constraints like access to proprietary GIG Logistics systems (Federico et al., 2024). The methodology emphasizes rigor through systematic procedures for data gathering and thematic analysis, ensuring findings are credible, transferable, and aligned with supply chain management scholarship.

Secondary data were gathered via a literature review. The process unfolded in three phases. First, the search strategy queried databases like Google Scholar, ResearchGate, Scopus, Web of Science, and African Journals Online (AJOL) from January 2010 to March 2026 to capture recent ICT advancements. Next, screening used criteria like peer-reviewed sources, Nigeria/Africa focus, and post-2010 date to select 82 full-text articles after reviewing titles and abstracts. Finally, snowballing and grey literature reviewed industry reports such as GIG Logistics ' annual report on ICT adoption.

Thematic analysis was employed to interpret the secondary data, following Braun and Clarke's (2006) six-phase framework, which is ideal for identifying patterns in logistics ICT literature (Adekunle & Isokpan, 2023). Trustworthiness was enhanced through member-checking (cross-verifying with recent GIG reports), peer debriefing, and thick descriptions for transferability. No ethical issues arose, as all sources were publicly available. This

methodology provides a robust foundation for analyzing the digital freight platforms' role in GIG Logistics ICT adoption, bridging theory and practice in Nigeria logistics context.

4 RESULTS AND DISCUSSION

4.1 ICT Application

GIG Logistics (GIGL), formerly God Is Good Logistics, is a leading Nigerian logistics service provider offering domestic and international courier services, freight transport, e-commerce fulfilment, warehousing, and last-mile delivery. Operating across major urban centres, GIGL extensively leverages ICT applications to coordinate its operations efficiently. According to GIG company official website, key ICT applications include:

i. **GIGGo Mobile Platform**: A digital app that allows customers to book pickups, track shipments in real time, and make payments (Tomi, 2019; Nwanma, 2019; Ehigiator, 2026).
ii. **Real-Time Tracking Technology**: Systems that provide visibility into shipment locations and delivery progress, enhancing accountability and performance monitoring (Ehigiator, 2026).
iii. **Integrated Digital Systems and APIs**: Technology-enabled logistics and API integrations that streamline booking, tracking, and delivery processes across services (Mololuwa & Ekene 2025).
iv. **Visibility and Performance Tools**: While not explicitly described as "analytics dashboards," The GIGL platforms offer real-time data and performance visibility to users and business partners (Tomi, 2019; Ehigiator, 2026).

GIG Logistics serves as a practical illustration of ICT adoption in Nigeria logistics sector (Nwanma, 2019). The company uses ERP, TMS, mobile applications, GPS, and analytics reflects the broader trends identified in the literature, while its adaptations to local infrastructural and regulatory challenges demonstrate the contextual nature of ICT implementation (Nwanma, 2019; Ojadi et al., 2019; Acheampong et al., 2020). Importantly, GIGL's strategic and systematic approach to ICT aligns with the RBV perspective, showing how technology combined with organizational capability can yield competitive advantage (Ehigiator, 2026; Nwanma, 2019).

4.2 Critical Reflection: Observations and Implications for Nigerian Logistics

Having reviewed the literature and examined GIG Logistics as a case example, several reflections emerge that warrant consideration.

i. **The digital divide within Nigeria remains a significant constraint**: While GIG Logistics successfully deploys mobile applications and real-time tracking, these tools assume reliable internet connectivity and smartphone access conditions not uniformly present across the country (Nwanma, 2019; Tomi, 2019). In rural areas or among lower-income customer segments, the effectiveness of ICT solutions may be diminished. This raises questions about whether ICT adoption might inadvertently create a two-tiered logistics system, serving urban, digitally connected populations while leaving others underserved.
ii. **Organizational culture and employee readiness often determine success more than the technology itself**: From this perspective, the literature tends to emphasize technological capabilities while giving less attention to human factors. In the Nigerian context, where educational attainment and digital literacy vary widely, investing in employee training and change management may be as important as acquiring software. Resistance to new systems, whether from drivers accustomed to manual processes or from managers reluctant to embrace data-driven decisions, could undermine even the most sophisticated ICT investments.
iii. **The cost-benefit equation for SMEs differs dramatically from large firms like GIG Logistics**: While GIGL can afford cloud-based ERP and custom mobile platforms, smaller logistics operators may struggle to finance such systems (Tomi, 2019). This suggests that ICT adoption could accelerate market concentration, with large players gaining competitive advantages that smaller firms cannot match (Tomi, 2019). Policymakers and industry associations might need to consider shared infrastructure or subsidized access to level the playing field.
iv. **Regulatory uncertainty in Nigeria poses unique challenges**: Inconsistent government policies, poor enforcement of logistics regulations, and inadequate investment in physical infrastructure (roads, ports,

broadband) create an environment where even well-designed ICT systems face limitations. For example, route optimization software is only as effective as the roads it plans for; if infrastructure is unpredictable, the software's recommendations may prove unreliable. This underscores that ICT is not a panacea but must be complemented by broader institutional improvements.

v. **The sustainability claims in the literature must be examined critically**: While ICT enables route optimization and reduced emissions in theory, Nigerian realities, including reliance on diesel generators for power, aged vehicle fleets, and chaotic traffic patterns, may diminish these environmental benefits. Without empirical studies measuring actual emissions reductions, it remains uncertain whether ICT adoption in Nigeria genuinely advances green logistics or simply transfers environmental burdens elsewhere.

These observations suggest that while the trajectory of ICT adoption in Nigerian logistics is promising, its realization depends on addressing contextual realities that extend beyond technology alone. Future research and practice must attend to the human, infrastructural, and policy dimensions that shape how digital tools perform in specific environments.

5 CONCLUSION AND RECOMMENDATION

This literature review has critically examined the role of ICT in Logistics and Supply Chain Management, focusing on digital freight platforms and advanced ICT tools. The study demonstrates that ICT adoption through ERP, TMS, WMS, mobile applications, GPS/IoT, cloud computing, big data analytics, blockchain, and AI enhances operational efficiency, visibility, coordination, and customer satisfaction.

In Nigeria, GIG Logistics illustrates the practical application of these technologies in a developing economy. ICT adoption enables the company to overcome infrastructural and operational challenges, optimize last-mile delivery, and integrate sustainability practices. The theoretical frameworks of TAM, TOE, DOI, and RBV provide lenses for understanding adoption drivers and the strategic value of ICT.

In all, ICT adoption is indispensable for contemporary logistics, particularly in developing economies. Digital freight platforms, integrated mobile and cloud systems, and emerging technologies collectively enhance supply chain performance, resilience, and competitiveness (Tiwari, et al., 2024). However, realizing these benefits requires attention to local contexts, human factors, and supportive policies.

Based on the literature review findings, the following recommendations are proposed for logistics firms in Nigeria and similar developing economies:

1. Strategic ICT Integration: Logistics firms should adopt ICT not merely as operational tools but as strategic assets. Integration of ERP, TMS, WMS, and mobile platforms into a unified digital ecosystem enhances coordination, visibility, and long-term competitiveness (Mololuwa & Ekene 2025). Investment should align with organizational capabilities, as emphasized by the RBV framework.
2. Investment in Skills and Organizational Readiness: ICT adoption success depends on employee competence and managerial support. Organizations should invest in continuous training programs to enhance digital literacy, technical expertise, and change management capacity, thereby reducing resistance and improving system utilization.
3. Cloud-Based and Scalable Solutions for SMEs: Small and medium-sized logistics firms in Nigeria should prioritize cloud-based ICT solutions. Cloud platforms reduce capital expenditure, improve scalability, and allow gradual digital transformation without heavy infrastructure costs.
4. Strengthening Last-Mile Delivery through Digital Platforms: Given Nigeria's infrastructural challenges, firms should expand mobile-based tracking systems, GPS enabled route optimization, and customer communication platforms to improve last-mile efficiency and customer satisfaction.
5. Government and Regulatory Support: Policy makers should improve digital infrastructure, promote broadband access, and develop supportive regulatory frameworks that encourage ICT innovation in logistics. Public-private collaboration can accelerate digital transformation.

6. Sustainability Integration: Logistics firms should leverage ICT for green logistics by implementing route optimization, load consolidation, predictive maintenance, and emissions monitoring systems. Sustainability metrics should be integrated into digital dashboards.
7. Future Research Direction: Researchers should conduct empirical studies evaluating the operational and environmental impact of ICT adoption in Nigerian logistics firms. Longitudinal studies examining long-term sustainability outcomes are particularly recommended.

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