

Technology Adoption Effect on Customer Experience in Logistics Companies in Nigeria

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ABSTRACT

This paper aimed at establishing the effect of technology adoption on customer experience in selected logistics companies in Nigeria. The study particularly looked into: (i) the influence of real-time tracking systems on customer satisfaction; and (ii) the effect of automated customer service platforms on customer loyalty. The research used the survey research approach. The target population of the study was 18,516,365 customers in selected logistics companies such as DHL Express, FedEx, UPS, and GIG Logistics in major cities including Lagos, Abuja and Port Harcourt. Applying the Taro Yamane formula, the sample size was 400 respondents at 5% significance level. The data were collected through a structured questionnaire, and then descriptive statistics and multiple regressions analyses were performed to analyze the data. The findings of the research revealed that adoption of real-time tracking technology enhanced customer satisfaction through transparency, reliability and quality of services. Also, automation of customer service system was found to have positive effect on customer loyalty due to faster handling of complaints from the clients. It can be noted that adoption of modern technologies is important for shaping customer experience in the logistics industry. The study therefore suggested that logistics companies should invest in innovative technologies in order to develop strong customer relations and compete in the Nigerian logistics market.

Key Words: Technology Adoption, Real-Time Tracking Systems, Automated Customer Service Platforms, Customer Satisfaction, Customer Loyalty.

INTRODUCTION

The global logistics industry is witnessing a drastic digital transformation due to the rise in the growth of e-commerce and increasing consumer demand for better supply chain visibility and efficient interactions. According to research, consumers will not visit any online store again following an unpleasant delivery experience since logistics plays a crucial role in influencing the consumer's perception and satisfaction levels (Aljohani, 2024). Under such circumstances, the application of digital technologies like real-time tracking and automated customer services has become an essential part of logistics operations rather than just being considered a competitive advantage that fundamentally alters customer relations with logistics companies.

Nigeria, the biggest African country economically, is an excellent research area concerning the application of technology in logistics since the value of its e-commerce sector exceeds \$10 billion (Zeng et al, 2025). At the same time, the logistics environment in Nigeria has multiple difficulties, which include complicated addressing system, traffic problems in cities, infrastructure deficit, and the fragmentation of logistics processes (Kuteyi & Winkler, 2025). According to the Logistics Performance Index compiled by the World Bank Group, Nigeria occupies the 125th place out of 138 total countries, which is associated with serious logistics issues reducing the ability of the country to compete (World Bank Group, 2022). In spite of such difficulties, many logistics

companies adopt digital solutions, like AI automation, real-time tracking, and delivery platforms (Atieh et al, 2025). The recent introduction of delivery choice and real-time tracking for over 60,000 Nigerian companies proves the current trend of using technology in the field of logistics (Shuaibu et al, 2025).

The theoretical link between technology adoption and customer experience has been well discussed in the scholarly literature in service and operations management. The Technology Acceptance Model offers a foundational theory which argues that perceived usefulness and ease of use have an impact on technology adoption decisions (Lee et al, 2025). Technology adoption in logistics refers to the use of digital technologies in service provision, aimed at decreasing information asymmetries, increasing transparency and offering control to the customers in service interactions. Customer experience refers to the perceptions, emotions and evaluations generated during service interactions. However, there is mixed empirical evidence; for instance, performance expectancy and hedonic motivation have been found to have an important impact on technology acceptance, while price sensitivity was found to have insignificant effect in the context of early adoption in developing countries (Pires et al, 2024). Furthermore, there are not enough studies conducted in developing countries, such as Sub-Saharan Africa, where the effects of technology may be affected by poor infrastructure conditions.

The current study explores the following technological artifacts used in modern logistics: real-time tracking systems and automated customer service platforms. The real-time tracking system is operationalized using the following proxies: frequency of updates, geographical location accuracy and exception notifications; this system increases customers' perception of shipment transparency and reduces uncertainty-related stress (Rao, 2025). The automated customer service platform includes chatbots and AI-powered helpdesk systems, which can be described using the following proxies: velocity of response, accuracy of response and interface personalization. The automation of customer service systems is expected to influence customer loyalty by demonstrating responsiveness and client orientation of an organization (Marcineková et al, 2025). Satisfaction and loyalty are conceptually different constructs; the first refers to evaluative judgment about particular service interaction, while the latter refers to affective commitment leading to repeat business.

This study explores the influence of technology adoption on customer experience in some selected logistics firms in Nigeria. Specifically, it aims to establish (i) the influence of real-time tracking systems on customer satisfaction; and (ii) the effect of automated customer service platforms on customer loyalty. In order to achieve these objectives, a quantitative and survey-based research design will be used.

LITERATURE REVIEW

Conceptual Review

Technology Adoption

The conceptual base of technology adoption in logistics is provided by the Technology Acceptance Model (TAM), which suggests that perceived usefulness and perceived ease of use are determinants of acceptance and subsequent use of technology (Lee et al, 2025). Technology adoption in logistics involves using digital solutions including tracking systems, automated communication channels, as well as artificial intelligence-powered analytics in order to improve service delivery and, consequently, customer experience (Oncioiu et al., 2025). Conceptually, this variable is important for customer experience because information technologies can reduce information asymmetry, increase transparency and give customers more control over their experience of using services (Yu et al, 2024). Technological adoption and technology assimilation are two different concepts, as the latter one denotes how deep and extensive technology adoption is (Pazhanimala, 2023). Moreover, technology adoption is a separate term from technology readiness that describes individual's readiness to adopt technology (Wang et al, 2025). Being multidimensional in nature, technology adoption cannot be measured by any one-dimensional metrics, so it should be decomposed into measurable dimensions reflecting technological capability and user experience.

In the Nigerian logistics industry, the use and success of technology adoption proxies are particularly constrained by infrastructure limitations, regulations, and lack of technical know-how (Afolabi1 & Mudashiru, 2026). The Logistics Performance Index ranking of Nigeria at 125 out of 138 countries indicates problems within the system

that will affect technology adoption (World Bank Group, 2022). While geolocation can provide more efficiency in tracking packages, the complex address system and unpredictable network connection can reduce its effectiveness in urban centers in Nigeria (Chukwurah et al, 2025). Previous studies on the use of technology in Sub-Saharan African logistics have shown the importance of contextual considerations such as cultural issues, infrastructural constraints, and trust building processes in moderating technology effects (Kuteyi & Winkler; 2022). The use of the Technology Acceptance Model in emerging economies to explore technology use has indicated that the ease of use and usefulness of technology have a significant effect on technology acceptance in logistics operations (Kelly & Palaniappan, 2023).

Customer Experience

Technology Acceptance Model and Service Quality Theory form the basis of customer experience in logistics service delivery since both theories indicate that customers' perception of technology use plays an important role in evaluations and behavioural decisions (Lin et al, 2023). The concept of customer experience in logistics is defined as the set of perceptions, emotions, and evaluations that emerge as a result of the entire process of interaction between the customer and the service provider (Tramvalidou & Vrana, 2024). In theory, customer experience is important since it is the main determinant of satisfaction, loyalty, trust, and word-of-mouth intentions. Customer experience operationalisation within the Nigerian logistics sector is limited by the infrastructural constraints, cultural expectations, and customer digital literacy level (Afolabi & Mudashiru, 2026). With the ranking of 125 out of 138 countries on the Logistics Performance Index, infrastructural inefficiencies have made delivery time unpredictable and cause communication failures (World Bank Group, 2022). Within such an environment, satisfaction is determined by the ability of technology to eliminate uncertainties; real-time tracking technologies that include exception notifications and update frequency are highly valued for reducing the stress caused by unpredictability (Dağdeviren & Mirza, 2024). Loyalty in Nigeria appears to be more complicated since, apart from the global definition of loyalty in terms of quality services and trust, Sub-Saharan African markets show the strong presence of loyalty mediators in the form of cultural alignment, trust of vendor reliability, and community reputation (Ojesina, 2020). Resolution accuracy is hindered by unstructured, colloquial queries typical for local communication style and thus creating difficulties in automated service platform functioning (Susanto et al, 2026).

Nexus Between Technology Adoption and Customer Experience

The link between real-time tracking system adoption and customer satisfaction relies on the ability of technologies enhancing visibility to reduce uncertainty-related anxiety and increase trust during delivery process (Pires et al., 2025). Through real-time tracking, customers can be sure about the delivery process, eliminating post-purchase anxiety and building trust during the whole process of delivery (Udayakumar & Nagarajan, 2024). It is important to explain the connection between the theory of tracking and its effect on customer satisfaction. The theoretical link between them is based on information transparency – when clients get constant feedbacks and updates, they feel higher levels of perceived control over service interactions, leading to better quality evaluation (Elshaer et al, 2024). The evidence from the logistics industry shows that the ability to track the order in real time improves the performance and reduces customer anxiety; interactive delivery systems offer such features as address verification, delivery scheduling and geofence verification (Sherlin & Rajalakshmi, 2026).

There is a strong relation between automated customer service platforms and the development of customer loyalty that is based on the ability of artificial intelligence-driven communication tools to provide accurate and personalised service interaction (Żyminkowska & Zachurzok-Srebrny, 2025). Automated customer service platforms include chatbots, artificial intelligence helpdesks and other similar solutions and influence the loyalty through three main channels: velocity of response, resolution accuracy and personalisation of interfaces (Marcineková et al, 2025). When the system is capable of resolving the issues by itself without human intervention, it shows organisational capability, building trust and loyalty (Wang et al, 2026). Although velocity of response is necessary for the first contact, resolution accuracy and personalisation are the key drivers of affective loyalty because transactional efficiency is not enough for client return (Pires et al, 2025). The evidence from the industry of e-commerce logistics proves that the usage of artificial intelligence-based post-purchase communication leads to 85% increase in customer retention and 42% more purchases (Mittameedi & Dogra, 2026).

The market environment in Nigeria also shows that the conversational AI now takes care of more than half of the customers' queries in the major e-commerce platforms by providing faster responses and round-the-clock service (Madanchian, 2024). But the effectiveness of such technologies in Nigeria will depend largely on context as the personalization of interface should not only be transactional but cultural and linguistic as well and should entail usage of Pidgin English and other vernacular languages, which would help in making the interaction meaningful for diverse segments of customers (Okafor, 2022). Nevertheless, the possibilities of using technology for increasing the satisfaction and loyalty of customers in Nigerian logistics are quite promising, as there have been calls from industry experts for widespread use of AI and IoT technologies (Olusegun et al, 2025).

Theoretical Review

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was first created by Davis (1989), and is a theoretical framework used to analyze the adoption and use of technological innovations by logistics companies and their clients. According to the model, the adoption and utilization of the technology by an individual depends on two cognitive beliefs, namely, perceived usefulness (PU) and perceived ease of use (PEOU). Perceived usefulness refers to the belief of a person that a certain innovation will improve his or her performance when used (Davis, 1989). Perceived ease of use is the belief that using the technology will be effortless (Davis, 1989). In the case of logistics, PU will relate to customer perceptions regarding the usefulness of real-time tracking and automated customer service platforms in enhancing their experiences (Atieh et al, 2025). This includes issues like the ability of tracking systems to increase visibility, reduce uncertainty or provide for faster response to clients' queries. On the other hand, PEOU will refer to client perceptions concerning the effortlessness of interacting with these technological tools (Denovan et al, 2025). Previous research in the area of logistics has indicated that the constructs are key determinants of user adoption and satisfaction. Specifically, in emerging markets, perceived usefulness and ease of use have been identified as some of the key motivators for adoption and continued use of logistics platforms (Chanthawong et al, 2026). As a result, when customers perceive tracking systems to be useful for delivery monitoring and automated platforms to be easy to use, they become satisfied and develop loyalty to the technology (Pires et al., 2025). However, one needs to note that there are various factors like infrastructure gaps, digital illiteracy, and culture that can weaken the relationship between perceived ease of use and satisfaction and strengthen the relationship between perceived usefulness and satisfaction in places like Nigeria (Elebiju, 2024).

Theory of Service Quality (SERVQUAL)

Service Quality Theory, through the framework of SERVQUAL model designed by Parasuraman, Zeithaml, and Berry (1988) is yet another theoretical foundation that complements the research on the effect of technology-enabled logistics services on customers' satisfaction and loyalty. According to SERVQUAL, service quality is determined by the difference between customer expectations and perception of actual service performance in relation to five dimensions of quality – tangibility, reliability, responsiveness, assurance and empathy (Parasuraman et al., 1988). In the field of logistics, SERVQUAL framework has been expanded to capture the peculiarities of logistics service quality and empirically proved to involve such critical dimensions as timeliness, order conditions/accuracy, information quality, quality and availability of contact personnel, and more recently, IT tool quality (Udayakumar & Nagarajan, 2024). The relevance of SERVQUAL theory to this study stems from its ability to explain the contribution of technology adoption specifically, real time tracking systems and automated customer service platforms, to enhancing customers' perceived service quality dimensions (Arli et al, 2024).

RESEARCH METHODOLOGY

Research Design

A cross-sectional survey research design was used in this study, which involved the collection of data from the respondents at one point in time (Saunders et al., 2019). Cross-sectional survey research design was chosen due to its appropriateness for investigating the current state of adoption and use of technology and customer

experiences in logistics firms, efficiency in collecting data from a relatively large number of people in a limited time frame, and being relatively inexpensive compared to other designs such as longitudinal design (Creswell & Creswell, 2018). Survey research design was deemed to be the most appropriate for this study since it provides an opportunity to capture perceptions and evaluation of technology-enabled logistics service from many customers, collect standardized data from a relatively large number of logistics firms, and make statistical generalization of the results to the population of logistics customers in Nigeria (Saunders et al., 2019).

Population and Sampling Strategy

In this study, the target population consists of the customers of selected logistics firms operating in Nigeria. Specifically, customers of the following firms were included: DHL Express, FedEx, UPS, and GIG Logistics. The selected logistics firms were purposefully chosen because of their popularity in the Nigerian logistics industry, adoption of digital technologies, and accessibility (Okpeku, 2026). As for the geographical location of the selected customers, only those operating and doing business in major cities of Nigeria such as Lagos, Abuja, and Port Harcourt will be targeted. Inclusion criteria stipulated that participants had to have used the services of at least one of the selected logistics firms in the last six months and be at least 18 years old.

A probability sampling method involving stratified random sampling was applied to ensure that all four logistics firms were proportionally represented. Stratification was done based on the type of logistics firm visited, with proportional allocation of respondents among DHL Express, FedEx, UPS, and GIG Logistics depending on the estimated sizes of the clientelae of each firm.

Sample size determination was based on Taro Yamane formula at 5% significance level: $n = N / (1 + N(e)^2)$, where N is population size and e is margin of error (Yamane, 1967). Since the total population size is 18,516,365, the sample size was calculated to be 400. Although the sampling technique used improves representativeness, the limited geographical location to major urban cities and four logistics firms might reduce the external validity of results outside the sampled cities and four logistics firms in Nigeria.

Instrument for Data Collection

For the data collection instrument, a structured questionnaire was used. The questionnaire was developed through the use of validated scales from previous empirical literature. It was made up of five parts. Part A contained demographic details of the respondents, such as age, gender, educational attainment, and the frequency of logistics services visitation. Part B was self-developed and was structured in line with the research objectives. All the questions were rated on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree).

Techniques for Data Analysis

Data analysis was done using Statistical Package for Social Sciences (SPSS) version 27.0. Descriptive statistical methods such as frequencies, percentages, means and standard deviation were used to describe characteristics of respondents and variables. The inferential statistical analysis used Regression analysis to test the hypotheses.

DATA ANALYSIS AND RESULT

Regression analysis at 5% level of significance was used to analyze the data

Tests of Hypotheses

Hypothesis One

H₀₁: Real time tracking systems have no significant impact on customer satisfaction in logistic firms in Nigeria.

Model Summary

Table 4.1.1a

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.525 ^a	.0.275	.266	.36149
a. Predictors: (Constant), Real time tracking systems				

Source: Researcher's Field Work (2026)

ANOVA ^a						
Table 4.1.1b						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	16.424	1	16.424	93.851	.026 ^b
	Residual	62.350	399	.175		
	Total	62.670	400			
a. Dependent Variable: customer satisfaction						
b. Predictors: (Constant), Real time tracking systems						

Source: Researcher's Field Work (2026)

Coefficients ^a						
Table 4.1.1c						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.974	.219		18.129	.000
	Real time tracking systems	.413	.032	.625	12.906	.026
a. Dependent Variable: customer satisfaction						

Source: Researcher's Field Work (2026)

The data required for testing this hypothesis were provided through the questionnaires' responses. For the test of the validity of the effect of real-time tracking system on customer satisfaction in selected logistics firms in Nigeria, multiple regression analysis was carried out. From tables 4.1.1a, 4.1.1b, and 4.1.1c above, we observe that the regression model provides evidence that the independent variable significantly affects the dependent variable ($R^2 \text{ calc} = 0.275 (27.5\%) > \text{at } p < 0.05$). The significant level is 0.026, and therefore we reject the null hypothesis and adopt the alternative, which argues that the real-time tracking systems have a significant effect on customer satisfaction in selected logistics firms in Nigeria.

Hypothesis Two

H₀₂: Automated customer service platforms do not have significant impact on customer loyalty within logistics firms in Nigeria.

Model Summary

Table 4.1.2a

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.513 ^a	.263	.232	.21840

a. Predictors: (Constant), Automated customer service

Source: Researcher's Field Work (2026)

ANOVA^a

Table 4.1.2b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	14.576	1	14.576	86.248	0.000 ^b
	Residual	61.450	399	.169		
	Total	61.450	400			

a. Dependent Variable: customer loyalty

b. Predictors: (Constant), Automated customer service

Source: Researcher's Field Work (2026)

Coefficients^a

Table 4.1.1c

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.974	.319		18.129	.000
	Automated customer service	.429	.043	.642	9.976	.000

a. Dependent Variable: customer loyalty

Source: Researcher's Field Work (2026)

Data collection for the test of this hypothesis was done based on respondents' answers to the questionnaire. Multiple regression analysis was conducted to test the validity of the impact of automated customer service platforms on customer loyalty in selected logistics firms in Nigeria. As shown in tables 4.1.2a, 4.1.2b and 4.1.2c above, the regression results indicate the presence of a significant effect of the independent variable on the dependent variable (R^2 calc = 0.263 (26.3%) > at $p < 0.05$). It was observed that the significant level is 0.000, and due to this, the null hypothesis is rejected and accepts the alternative one which claims that there exists a significant impact of automated customer service platforms on customer loyalty within logistics firms in Nigeria.

DISCUSSIONS OF FINDINGS

Based on the findings from hypothesis one, it was established that there exists a significant effect of real-time tracking systems on customer satisfaction in selected logistics firms in Nigeria, $p\text{-value} = 0.026 < 0.05$ and R-square value is 0.275 and thus, about 27.5% of the variance in customer satisfaction is explained by real-time tracking systems. These findings support the research work carried out by Catherine and Pearline Jebamalar Blessy (2026), where in their study on the "Impact of Real-Time Tracking Systems on Customer Satisfaction in E-Commerce Deliveries among Chennai Customers", they established that GPS, RFID and mobile tracking systems help to increase transparency, trust and service quality hence improving customer satisfaction. Their findings indicated that delivery openness increases trust, GPS and RFID increase the precision of the tracking system and timely updates reduces uncertainty, findings which agree with the present study which found out that there is a significant effect of real-time tracking systems on customer satisfaction.

Findings related to hypothesis two have shown that the use of automated customer service platforms greatly influences customer loyalty within logistics companies in Nigeria, $p\text{-value} = 0.000 < 0.05$, while R-square value of 0.263 indicates that about 26.3% of variance in customer loyalty is associated with automated customer service platforms. The findings are in line with those made by Jenneboer, Herrando, and Constantinides (2022) in their systematic literature review on "The Impact of Chatbots on Customer Loyalty." They identified system quality, service quality, and information quality as major dimensions that chatbots should meet to provide a positive customer experience. According to their findings, chatbots that exhibit human-like nature generate more satisfaction and trust in clients, thus increasing their acceptance of the chatbots. The researchers conclude that the relationship between chatbots and customer loyalty is highly probable.

Summary of Findings

The following findings have been obtained as a result of the research:

1. The use of real-time tracking systems had a positive impact on customer satisfaction in selected logistics companies in Nigeria ($\beta = 0.625$, $p = 0.026 < 0.05$). It implies that high levels of real-time tracking system usage greatly increase chances of logistics companies getting higher customer satisfaction rates.
2. The use of automated customer service platforms had a positive impact on customer loyalty within logistics companies in Nigeria ($\beta = 0.642$, $p = 0.000 < 0.05$). It implies that improved automated customer service platforms increase chances of logistics companies obtaining higher customer loyalty rates.

CONCLUSION

The study has revealed that technology adoption is an essential determinant of customer experience in selected logistics firms in Nigeria. This is because the findings have shown that real-time tracking and automated customer service platforms both make substantial positive contributions to key customer experience outputs such as customer satisfaction and customer loyalty. Overall, the findings indicate that technology adoption is not only useful from an operations perspective but also a valuable strategy that helps to build stronger customer relationships, enhance service transparency, increase responsiveness and develop customer commitment. Accordingly, logistics firms that adopt technology through investing in effective technological systems especially real-time tracking and automated customer service platforms are well placed to cope with emerging customer demands, maintain service excellence and gain competitive advantage in the increasingly dynamic logistics industry in Nigeria.

Implications for Management

1. Real-time tracking systems of logistics firms must be enhanced through investments in GPS, RFID and mobile technologies to allow firms to give frequent and pro-active shipment updates to customers. This would help the firms to enhance transparency and decrease customer uncertainty, thus improving customer satisfaction, especially in Nigeria where infrastructural problems result in delivery anxiety.

2. Logistics firms need to upgrade their automated customer service platforms through AI chatbots and helpdesks that provide rapid response, resolution accuracy and interface customization. The interfaces must incorporate human-like interactions and language styles which include Pidgin English or other vernacular languages in order to build trust, satisfaction and customer loyalty.
3. The management must consider a holistic approach for adopting new technologies where visibility of shipment tracking in real time is combined with an automatic customer service system. The assurance of both timely and efficient response to the customers' queries will enable logistics companies to meet all the customer experience expectations starting from transparency up to engagement, which will increase competitiveness within Nigeria's logistics industry.

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