

E-commerce Growth and Product Delivery Efficiency in Logistic Service Companies: Policy Implications for Dalsey, Hillblom and Lynn (DHL), Delta State, Nigeria.

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Abstract

This study examines the relationship between e-commerce growth and product delivery efficiency, with a focus on DHL in Delta State Nigeria. The research aims to assess how the expansion of e-commerce impacts product delivery times and overall logistics performance. Using a quantitative research approach, the study employed a survey research design, gathering data from 150 DHL customers across Delta State through a structured questionnaire. Data were analyzed using descriptive and inferential statistics, including Pearson's Product-Moment Correlation, with SPSS version 25. The findings revealed that e-commerce has significantly enhanced operational efficiency, broadened customer reach, and improved the overall customer experience. Respondents agreed that DHL demonstrates consistency in delivery times, effectively manages e-commerce shipment requirements, and maintains timely deliveries despite increasing shipment volumes. Descriptive analyses also highlighted that e-commerce growth has streamlined operations, resulting in faster product deliveries and improved supply chain performance. However, some skewness in product delivery variables suggests areas for operational improvement. The study concludes that the growth of e-commerce has created both opportunities and challenges for logistics providers like DHL. While e-commerce has streamlined processes and enhanced customer satisfaction, it has also heightened the demand for speed, accuracy, and adaptability in logistics operations. The study recommends that DHL to leverage on advanced technologies, such as route optimization software and real-time tracking, to further enhance delivery efficiency. Additionally, strategic investments in infrastructure and workforce training are essential to sustain competitive advantage in the evolving e-commerce landscape. Policymakers are encouraged to create supportive regulatory frameworks to address logistics challenges and foster sustainable growth in the e-commerce sector in Nigeria.

Keywords: E-commerce Growth, Product Delivery, Efficiency, Policy Implication,

Introduction

E-commerce has changed the face of modern business. It has changed the way companies operate and how customers interact. E-commerce is not just an alternative market channel anymore, but a key part of a company's strategy (Nyati, 2021). E-commerce has evolved from an idea to an essential business model that has changed traditional retailing and marketing models (Babayev, 2024). According to Dewi and Lusikooy (2023), e-commerce has made possible seamless transactions using digital platforms by stripping away the need for geographical proximity. This has allowed consumers to enjoy greater freedom of choice through shopping from almost any place at any time (Babayev, 2024). Consumers have not only been given more freedom of choice, but also businesses are compelled to re-evaluate their strategies to remain competitive and relevant in this digital world (Thakur, 2021).

Furthermore, online platforms offer a wide array of benefits that revolutionize the shopping experience for consumers (Aziz, 2024). Customers can now browse and purchase products from

the comfort of their homes, online retailers can now provide broader selection options than physical stores (Bhattacharya, Lang & Hemerling, 2020; Banga *et al.*, 2021). Additionally, e-commerce platforms offer competitive pricing, enabling consumers to compare prices across multiple vendors and find the best deals available (Akin, 2024).

Apart from the benefits that is accrue to consumers, e-commerce has enabled the democratization of entrepreneurship by reducing the cost of entry for new businesses and by lowering the barriers for those willing to grow their business (Bao, 2023; Alawida *et al.*, 2022). E-commerce as also encouraged the development of small businesses by ensuring a more equal competing footing with the giants in the industry (Mehmood *et al.*, 2024; Metta, 2023). Entrepreneurs now have access to global audience without needing to make large up-front investments in infrastructure, helping them to start and grow their business faster and more efficiently (Tang, 2023).

However, e-commerce growth is not entirely a smooth sailing. The most urgent concern in the domain, as highlighted by Taher (2021), is the hurdle of delivering products to customers in a timely and efficient manner. The higher volume of transactions in e-commerce has led to increased demand for faster delivery times and stricter performance standards on logistics operations (Reif, 2022). This has placed immense pressure on logistics providers to provide efficient services, manage stocks, optimize delivery routes, and resolve last-mile delivery issues (Duong, 2024). The increasing volume of orders, coupled with the need for speed and accuracy, has made logistics a critical bottleneck in the e-commerce ecosystem, requiring innovative solutions and adaptations to meet consumer demands effectively (Krishnan *et al.*, 2024). These challenges are further exacerbated by the complexity of managing vast networks of supply chains and last-mile deliveries, particularly in densely populated urban areas or remote regions (Khanh, 2024). Despite these challenges, scholars have highlighted enhanced accessibility, competitive pricing as significant opportunities for logistics companies in emerging markets like Nigeria (Adama & Okeke, 2024; Salami, 2024).

However, different scholars have looked at the issue of e-commerce and products delivery from different perspectives. Liu *et al* (2024) emphasize the role of advanced technologies in optimizing e-commerce delivery, Kotler and Keller (2023) highlight the importance of customer experience, Christopher (2024) examines the role of logistics infrastructure and supply chain integration in ensuring timely deliveries, Chakraborty and Paul (2023) explore the environmental impact of product delivery, Smith and Jones (2023) analyze the cost structures associated with last-mile logistics, Ahmed *et al* (2024) discuss the influence of government policies and regulations, particularly in cross-border transactions, and Hofstede and Singh (2024) analyze how cultural differences shape consumer expectations for delivery services. There is still a lack of in-depth research focusing specifically on product delivery time in Delta State Nigeria. This gap warrants further investigation to provide insights into how logistics companies effectively navigate the evolving landscape of e-commerce in Nigeria, with particular reference to Delta State. The study aimed at assessing the effect of e-commerce growth on product delivery time in DHL Nigeria.

Literature Review

The Resource-Based View (RBV) theory posits that a firm's competitive advantage stems from its unique bundle of resources and capabilities (Barney, Ketchen & Wright, 2021). When applied to the context of e-commerce growth and product delivery time in DHL Nigeria, RBV offers valuable insights into how logistic companies leverage their internal strengths to navigate the challenges and opportunities presented by the digital marketplace. In this framework, DHL Nigeria

strategically allocate their resources, such as advanced technology, skilled workforce, and extensive network infrastructure, to enhance operational efficiency and customer service in response to e-commerce growth.

For example, DHL Nigeria invests in sophisticated tracking systems and automated warehouses to streamline order fulfillment processes and improve delivery speed, thereby gaining a competitive edge in the e-commerce logistics market (Cooper *et al.*, 2023). The RBV theory emphasizes the significance of resources that are valuable, rare, inimitable, and non-substitutable (VRIN) in creating a sustainable competitive advantage. These capabilities not only improve operational efficiency but also enhance customer satisfaction by ensuring faster and more reliable deliveries. However, critics of the RBV theory argue that it overlooks external factors such as market dynamics and industry structure, which also play a significant role in shaping competitive advantage (Pereira & Bamel, 2021). In the context of e-commerce growth, logistic companies like DHL Nigeria face external challenges such as rapid technological disruptions, changing customer preferences, and intensifying competition from new market entrants and digital platforms (Cooper *et al.*, 2023). Overlooking external factor affects efficient delivery and quick response to customer request.

Product Delivery Efficiency

Product delivery efficiency stands as a pivotal element of the overall customer experience in e-commerce, influencing customer satisfaction and loyalty in significant ways (Ahmed, Karmaker & Rahman, 2020). In the digital age, where consumer expectations are continually rising, the efficiency of delivery services make or break a company's reputation (Adedoyin, 2022). Delivery efficiency encompasses multiple dimensions, including the speed of delivery, the reliability of the service, and the accuracy with which orders are fulfilled (Cui *et al.*, 2024). These factors collectively determine how well a logistics company like DHL Nigeria meets the expectations of its e-commerce customers.

Speed of delivery is a crucial factor in customer satisfaction (Kawa & Zdrenka, 2024). As consumers increasingly expect same-day or next-day delivery options, companies must ensure that their logistics operations are optimized to deliver products within the promised time frames. According to Rashid and Rasheed (2024), Agbeche (2022), the speed of delivery is directly linked to customer retention in the e-commerce sector, as delays lead to dissatisfaction and lost sales. Therefore, DHL Nigeria must continually assess and improve its delivery timelines to stay competitive.

E-commerce Growth

The e-commerce sector in Nigeria has experienced exponential growth in recent years, transforming the way Nigerians shop and conduct business. Nduji and Chris (2020) sees electronic commerce to involve the electronic transaction of services. Similarly, Nahar (2021) define electronic commerce to encompasses conducting business electronically, utilizing electronic text, sound, and video to ensure expansion of reach. This remarkable expansion is driven by factors like the internet, mobile technology and burgeoning middle class (Ahmed & Joshi, 2024).

First, increased internet penetration has played a pivotal role, as more Nigerians gain access to the internet, particularly through mobile devices (Ali, Gruchmann & Melkonyan, 2022). The proliferation of affordable smartphones and data plans has brought millions of Nigerians online, enabling them to explore and engage with digital marketplaces (Khatri, 2023). The convenience

of mobile apps and the ability to shop from anywhere at any time have made online shopping increasingly attractive to consumers (Nduji & Chris, 2020).

Mobile payment systems (such as mobile money and digital wallets) have also grown in prominence, offering secure and convenient ways for consumers to buy goods and services without having to visit physical stores or banks (Reardon *et al*, 2021). Another factor driving e-commerce growth in Nigeria is the rise of a middle class (Kern, 2021). As the size of the middle class increases, there is also a corresponding increase in disposable incomes and a shift in consumer preferences. This group of people is more likely to embrace the convenience of online shopping, as it allows for a greater selection of products that may not be available in local markets (Riley & Klein, 2021). In addition, e-commerce platforms often offer competitive prices, discounts and promotions that appeal to cost-conscious consumers.

However, the growth of e-commerce has been very rapid and has brought forth a number of challenges, especially in the infrastructural weaknesses in the logistic and delivery networks, especially the timely and accurate delivery of products or services (Spurer & Legentil, 2023). The transport infrastructure in Nigeria, especially roads and distribution centres, are often inadequate for supporting a fast-growing e-commerce sector (Metta, 2023). In most locations, poor road conditions, traffic and limited delivery routes often make it difficult for products to get to consumers.

Conversely, with both domestic and international logistics providers vying for market share, the company faces pressure to differentiate itself and maintain service quality (Gupta and Singh, 2020). Dong (2021) emphasizes that e-commerce heightens customer expectations for fast, reliable, and convenient shipping services. DHL Nigeria's performance hinges on its ability to consistently deliver parcels accurately and on time. Failure to meet customer expectations results in negative feedback, damages the company's reputation, and leads to customer attrition, ultimately impacting its performance in the e-commerce sector (Spurer & Legentil, 2023; Agbeche, 2022). Additionally, Tofan and Bostan (2022) note that failure to comply with regulatory standards results in fines, legal penalties, and reputational damage, posing risks to DHL Nigeria's performance and market standing.

E-commerce Growth and Product Delivery Time

In the literature, Afolabi *et al* (2023) looked at the role of the burgeoning e-commerce sector in Nigeria in improving the efficiency of the product delivery system. The authors adopted a mixed-methods approach involving the distribution of 500 surveys to customers and 50 interviews with logistics managers from leading e-commerce firms, including Jumia and Konga, in major Nigerian cities, namely Lagos, Abuja and Port Harcourt. The results showed that infrastructural deficiencies such as poor road networks and logistics inefficiencies were major reasons for delays in deliveries, which in turn affected customer satisfaction. The authors concluded that addressing these infrastructural challenges are fundamental to sustaining the e-commerce growth in Nigeria.

Furthermore, Eze, Nnenna and Ifeanyi (2024) explored the effect of delivery times on customer satisfaction and retention among Nigerian e-commerce users. The researchers used a quantitative research design to investigate this phenomenon. In order to achieve this, a structured questionnaire was used to collect data from 1,000 online shoppers who had made online purchases in the past six months, and the findings were drawn from major urban settings such as Lagos, Ibadan and Abuja. The study indicated that delayed deliveries resulted in decreased customer satisfaction and retention. Consequently, it was recommended that e-commerce companies in Nigeria leverage technological advancements and improve on logistics management to reduce delivery times.

Zhang, Yuan and Su (2024) examined how same-day delivery services can stimulate e-commerce platforms and their market share in China, with a focus on companies such as Alibaba and JD.com. The study used a longitudinal design and secondary data collected between 2018 and 2022. The data came from company reports and feedback from customers who were surveyed online. Data visualization techniques such as line graphs, pie charts and scatterplots were used along with statistical tests (such as regression) to examine the relationship between delivery times. In the study, delivery times could significantly increase customer satisfaction and help e-commerce companies expand their market share. Logistics innovations, such as the use of drones and automated warehouses, can potentially reduce delivery times, which could improve service efficiency.

In one study, conducted by Ahmed *et al* (2024), the authors considered the role of delivery times on customer satisfaction in the e-commerce field across five countries in Europe (Germany, France, the UK, Italy and Spain). Based on a survey-based analysis on 2,000 online shoppers in each country, as well as on in-depth interviews with logistics experts, the authors analysed the strategies that e-commerce companies are currently adopting to reduce delivery times. The delivery times had a direct impact on customer satisfaction, with the authors observing that in countries with advanced logistical networks, companies with short delivery times had a significant competitive advantage. To reduce delivery times, e-commerce companies were adopting advanced technologies, such as predictive analytics, and also leveraging partnerships with local couriers to optimize the delivery routes and minimize the time spent on delivery.

Materials and Methods

This study adopted a quantitative research method. Quantitative method enables the identification of patterns, relationships, and trends within the data, facilitating objective interpretations and generalizations (Starman, 2013). The research design adopted for the study is survey research design, particularly employing survey questionnaire. Survey allows for the collection of large amounts of data from a diverse sample within a relatively short period (Aithal & Aithal, 2020). Consequently, 150 customers with DHL Nigeria formed the study participants. Simple random sampling technique was utilized, ensuring that every individual within the population of interest had an equal opportunity to be included in the sample (Clark *et al*, 2021). Data were analysed considering the descriptive and inferential statistics. The data were presented in tables and analyzed using descriptive and inferential statistics using software version 25 of SPSS. The relationship between e-commerce and product delivery time was analyzed using Pearson product movement correlation and this was aided with the statistical package for social science software (SPSS) version 25.

Result of the Findings

Descriptive Analysis of Response Data: Respondents opinion on Product Delivery

Table 1: Respondents on Product Delivery

Statements	SA	A	UN	D	SD	Total	Mean	STD. Dev	Decision
1. The consistency of DHL's delivery times satisfies my expectations compared FedEx delivery time	38	46	28	28	6.7	150	3.49	1.241	Agree
	25.3%	30.7%	18.7%	18.7%	10%				
2. DHL is flexible in handling the diverse requirements of e-commerce shipments, such as same-day delivery and returns.	47	40	1932	19	12	150	3.61	1.269	Agree
	31.3%	26.7%	21.3%	12.7%	8%				
3. DHL consistently delivers packages on time despite the increasing volume of e-commerce shipments	53	34	28	24	11	150	3.63	1.308	Agree
	35.3%	22.7%	22.7%	16%	7.3%				
Total							3.576		Agree

Source: Researcher's Computation from SPSS Output, 2025

From the Table 1, it can be observed that the respondents agreed that the consistency of DHL's delivery times satisfies their expectations. The respondents' agreement on DHL's delivery performance highlights the company's strengths in operational efficiency and customer satisfaction. These implications suggest that DHL should continue to leverage these strengths to maintain its competitive edge, enhance customer loyalty, and drive business growth.

Descriptive Analysis of Response Data: Respondents opinion on E-commerce Growth

Table 2: Respondents' opinion on E-Commerce Growth

Statements	SA	A	UN	D	SD	Tot	Mean	STD	Decision
1. E-commerce has significantly expanded our ability to reach a broader customer base	70	28	15	29	8	150	3.82	1.341	Agree
	46.7%	18.7%	10%	19.3%	5.3%				
2.The adoption of new technologies has accelerated the growth of e-commerce in our organization	62	33	29	19	7	150	3.83	1.230	Agree
	41.3%	22%	19.3%	12.7%	4.7%				
3.E-commerce platforms have improved the overall customer experience by providing better convenience and accessibility.	57	37	30	11	15	150	3.73	1.309	Agree
	38%	24.7%	20%	7.3%	10%				
4.E-commerce has streamlined operations, resulting in faster product delivery and enhanced supply chain performance.	60	35	22	18	15	150	3.71	1.363	Agree
	40%	23.3%	13.7%	12%	10%				
Total							3.77		

Source: Researcher's Computation from SPSS Output, 2025

From the Table 2, the total mean score across all four statements is 3.77, indicating general agreement among respondents regarding the positive impact of e-commerce on their operations. The relatively small standard deviations reflect moderate consistency in their responses, suggesting that most participants recognize the benefits of e-commerce in expanding customer reach, leveraging new technologies, improving customer experience, and streamlining operations.

Descriptive Analysis of Variables

The descriptive analysis of the data to see how each variable is distributed. The measures of central tendency like the mean, median, standard deviation and measures of distribution like index of kurtosis & skewness can be estimated from the Table 3 as follows:

Table 3 Analysis of Variables

		Product_Delivery	E-commerce Growth
N	Valid	150	150
	Missing	0	0
Mean		3.5756	3.7733
Median		3.6667	4.0000
Std. Deviation		1.02460	.98109
Skewness		-.822	-.916
Std. Error of Skewness		.198	.198
Kurtosis		-.280	-.047
Std. Error of Kurtosis		.394	.394

Source: Researcher's Computation from SPSS Output, 2025

Table 3, Product Delivery has a mean of 3.575, median of 3.666 which are very different from each other, this is an indication that this variable is probably not normally distributed. Recognizing and addressing the underlying causes of this skewness helps DHL to enhance its product delivery services and better meet customer expectations.

Bi-variate Analysis

Bi-variate analysis was conducted to determine whether there is a statistically significant relationship between the variables.

Hypothesis one.

H₀₁: There is no significant relationship between e-commerce growth and product delivery time at DHL Nigeria.

Table 4: Correlations

			E-commerce Growth	Product Delivery
Pearson correlation coefficient(r)	E-commerce Growth	Correlation Coefficient	1.000	.571**
		Sig. (2-tailed)	.	.000
		N	150	150
	Product Delivery	Correlation Coefficient	.571**	1.000
		Sig. (2-tailed)	.000	.
		N	150	150

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Researcher's Computation from SPSS Output, 2025

Table 4 reveals that the Pearson correlation coefficient(r) is 0.571 which reflect a strong positive relationship between e-commerce growth and the product delivery time at DHL Nigeria (r>0.3). This analysis highlights the substantial impact of e-commerce growth on product delivery

efficiency, validating their positive and significant relationship. Positive relationship means that as e-commerce growth increases, product delivery time tends to increase as well. Since the p-value of 0.000 is less than 0.05, we reject the null hypothesis. This means that there is a significant influence of e-commerce growth on product delivery time ($r = 0.571$, $p=0.00$). Therefore, null hypothesis was rejected. As e-commerce grows, DHL must strategically enhance its logistics and operational frameworks to manage delivery times effectively and sustain customer satisfaction.

Discussion of Findings

There is a significant relationship between e-commerce growth and product delivery time. The correlation coefficient (r) of 0.571 and the p-value of 0.00 indicate a significant positive relationship between e-commerce growth and product delivery time. This finding underscores the imperative for logistics companies like DHL to adapt and optimize their operations in response to the burgeoning e-commerce sector (Smith *et al.*, 2022). With e-commerce continuing to expand rapidly, DHL must strategically enhance its logistics and operational frameworks to manage delivery times effectively. Failure to do so risks compromising customer satisfaction and losing market share to competitors who can offer expedited delivery services. As highlighted by Jones and Brown (2020), in today's hypercompetitive market, customers expect swift and reliable delivery of their purchases, making timely product delivery a critical factor in customer retention and loyalty. Therefore, investing in advanced logistics technology, streamlining supply chain processes, and optimizing delivery routes are essential steps for DHL to meet the evolving demands of the e-commerce landscape and maintain its competitive edge. Chen *et al* (2023) emphasizes that adopting automation technologies like warehouse robotics and AI-driven route planning significantly reduces delivery times, ultimately enhancing customer satisfaction.

Although the correlation coefficient (r) of 0.571 indicates some level of correlation between the variables and is statistically significant, several variables confound the simple relationship between e-commerce growth and product delivery times. As noted by Johnson, Adkins, and Chauvin (2020), seasonal fluctuations, changes in consumer habits, and external factors such as weather conditions significantly impact delivery times. Additionally, Gomez *et al.* (2024) highlight that market competition and varying logistics capabilities among courier companies contribute to disparities in delivery speed, with some improving their delivery times independently of e-commerce trends.

Furthermore, though e-commerce growth requires DHL to adjust its logistics and operating frameworks to meet consumers' expectations of faster product delivery, there is a cross-pressure generated by assuming that delivery speed is the sole determinant of quality. This assumption often leads to inefficiencies as companies' channel significant resources into accelerating delivery without focusing on broader logistics excellence, such as accuracy and reliability. According to Wilson (2021), "rushing solid results will never bring your company long-term success." This aligns with the findings of Taylor and Hughes (2023), who argue that while speed is crucial, neglecting accuracy and reliability can damage brand reputation in the long term. Therefore, DHL should not hastily implement measures to expedite deliveries without ensuring that these measures are supported by robust logistics and operational systems capable of sustaining high performance over time. As suggested by Clarkson *et al* (2024), a balanced approach that integrates speed, reliability, and sustainability is essential for long-term success in the e-commerce logistics industry.

Conclusion

The tremendous rise of e-commerce has revolutionized the logistics industry with many challenges and chances for such companies as DHL Nigeria. The findings of this study indicate strong correlations between the growth of e-commerce and product delivery time in DHL Nigeria. The study concludes that for effective delivery of products to customers, DHL should emphasize the need for tactical adaptations with the demand of the digital market.

Recommendations

Based on the findings, the following recommendations are proposed to help DHL Nigeria navigate the challenges and leverage the opportunities presented by the growth of e-commerce:

- i. DHL Nigeria should focus on strengthening its last-mile delivery network. Given the geographical challenges in Nigeria, particularly in rural areas, partnerships with local delivery firms or the establishment of localized distribution centers will improve service coverage and reduce delivery times.
- ii. Policy considerations should address workforce development. As the logistics sector becomes increasingly tech-driven, DHL Nigeria should invest in training programs to upskill its employees, ensuring they can operate and manage new technologies effectively.
- iii. DHL Nigeria should consider sustainability in its delivery operations. With growing awareness of environmental issues, consumers and businesses are increasingly looking for eco-friendly delivery options. Implementing green logistics practices, such as using electric vehicles, optimizing delivery routes to reduce emissions, and adopting sustainable packaging materials, can not only enhance DHL's brand image but also align with global sustainability goals.

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