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## The Influence of Warehouse Management, E-Commerce Technology, and External Factors on Customer Satisfaction in Goods Delivery Services

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**Abstract:** The rapid growth of e-commerce and globalization has positioned delivery services as a critical backbone of modern economic systems. However, customer satisfaction in this sector remains challenged by warehouse management inefficiencies, limited adoption of e-commerce technology, and uncertainties caused by external factors such as infrastructure conditions, regulatory changes, and socio-economic dynamics. This study aims to examine the influence of warehouse management, e-commerce technology, and external factors on customer satisfaction in delivery services. Employing a qualitative descriptive design with a literature review approach, this research synthesizes findings from previous studies indexed in reputable international databases including Scopus, Web of Science, Emerald, and Springer. Data analysis was conducted through comparative synthesis to identify similarities, differences, and interrelationships among the variables. The findings indicate that effective warehouse management improves delivery speed, cost efficiency, and service quality; e-commerce technology enhances transparency, platform accessibility, and customer engagement; while external factors such as infrastructure readiness and government policies significantly affect overall reliability. The study highlights that customer satisfaction is shaped by key indicators such as delivery speed, product security, affordability, and customer service quality. This research contributes theoretically by integrating three major determinants of logistics performance into a comprehensive framework, and practically by offering insights for logistics companies and policymakers to design adaptive strategies that enhance customer satisfaction in a rapidly evolving business environment.

**Keywords:** Customer Satisfaction in Goods Delivery Services, Warehouse Management, E-Commerce Technology, External Factors

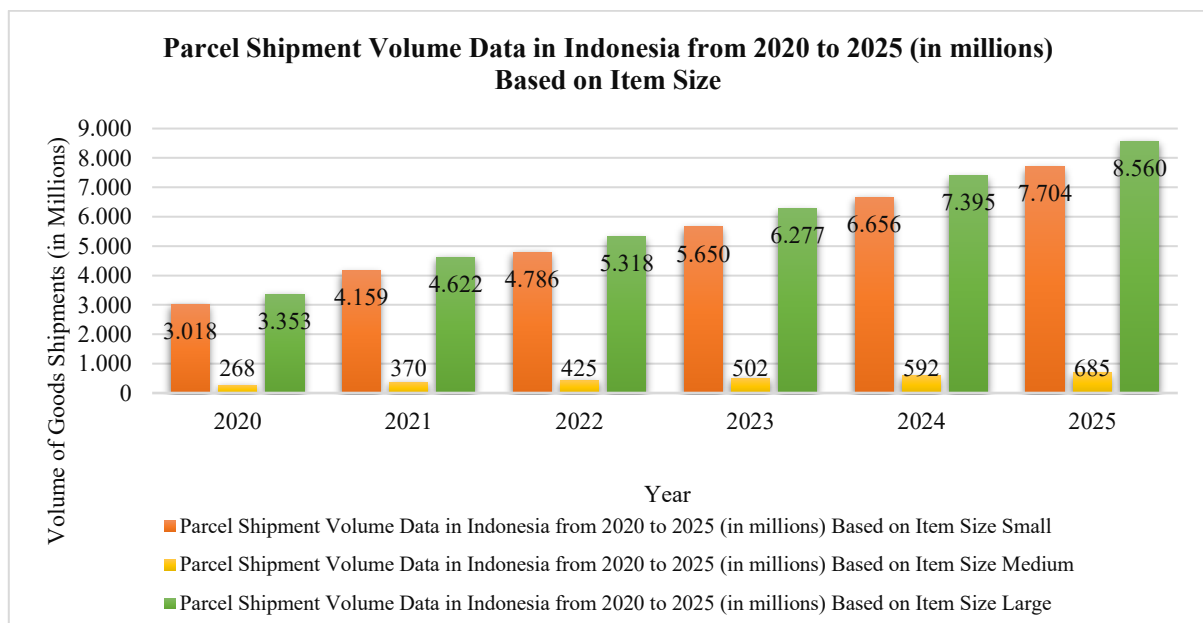
## INTRODUCTION

Freight forwarding services are increasingly recognized as the backbone of the global economy, particularly due to the surge in international trade and e-commerce, which demands efficient logistics systems. Globalization has increased the need for agile logistics solutions, enabling businesses to tap into broader markets and meet consumer expectations for fast delivery and personalized service (Erfan & Chubirka, 2024). The integration of advanced technologies, such as artificial intelligence, IoT, and blockchain in delivery management systems, improves operational efficiency and reduces costs, thereby increasing service reliability (Manapure, 2024).

However, customer satisfaction in freight forwarding services still faces serious challenges stemming from inefficient warehouse management, limited use of e-commerce technology, and uncertainty surrounding external factors such as regulations, infrastructure conditions, and socio-economic dynamics (Moussaoui et al., 2022). Customer satisfaction in delivery services is significantly hampered by inefficiencies in warehouse management, limited adoption of e-commerce technology, and external uncertainties such as regulatory frameworks and socioeconomic conditions (Verma, 2025).

A systematic literature review identified five key determinants of customer satisfaction, including service quality and delivery timeliness, which are particularly important in the context of e-commerce (Aini et al., 2025). In addition, research shows that timely delivery and high service quality are crucial for maintaining customer loyalty, especially in the rapidly growing e-commerce landscape (DwiNov et al., 2025).

A review of sustainable logistics practices is crucial because it provides a theoretical and practical framework for logistics companies and policymakers to improve customer satisfaction in a rapidly evolving global business environment. The integration of sustainable development principles, driven by technological advances such as the Internet of Things, big data, and blockchain, is essential for improving operational efficiency and reducing environmental impact (Abdelaziz & Munawaroh, 2025).



Source: (Pratama, 2024)

**Figure 1. Data Volume Pengiriman Parcel di Indonesia tahun 2020-2025 (dalam juta)  
Berdasarkan Ukuran Barang**

Figure 1 illustrates the trend in the volume of goods shipments in Indonesia from 2020 to 2025, distinguishing goods by size into three categories: small, medium, and large. In general, the graph shows that shipments of small and large goods have a relatively larger volume than medium goods throughout the observation period. This confirms a pattern of distribution of community logistics needs that tends to focus on two extreme segments, namely small goods that dominate e-commerce retail transactions and large goods that are closely related to the industrial and large-scale business sectors. Meanwhile, the medium category tends to have lower volumes because it is between two segments that are very different in terms of both demand and distribution patterns.

In the small category, the surge in shipments was mainly triggered by the rapid development of e-commerce and people's online shopping habits. Items in this category, such as clothing, accessories, beauty products, and small electronic devices, are the most frequently traded commodities online. The high number of transactions has caused the volume of small package shipments to continue to increase year after year. This condition is reinforced by the penetration of marketplace platforms and express delivery services that provide a variety of fast delivery options at relatively affordable costs. Thus, the small category has become the most vital segment in driving the growth of the digital retail-based logistics industry, (Hidayat et al., 2024).

Conversely, the large category also shows a large volume despite its characteristics differing from the small category. Large items are generally related to inter-industry distribution, such as machinery, large household appliances, furniture, and manufactured products. Increased interregional trade activity and national infrastructure development have also expanded the need for the distribution of these large goods. Although the frequency of shipments per unit is not as high as the small category, each transaction in the large category contributes a significant volume due to the larger size and weight of the goods. This explains why the volume graph for the large category remains high throughout the 2020–2025 period.

On the other hand, the medium category is less dominant than the other two categories. Medium-sized goods, such as mid-range electronic devices, certain food products, or household goods, often do not have a significant volume advantage. These items are not as popular as small items that support people's digital lifestyles, but they are also not as large as industrial or manufacturing goods that are essential for businesses. As a result, the shipping volume of medium-sized goods has consistently been lower throughout the 2020–2025 period. This condition can be interpreted as the medium category being in a “gray area” between the needs of individual consumers, which tend to be light, and the needs of businesses, which tend to be heavy (Almadina & Badriyah, 2023).

This phenomenon has strategic implications for logistics companies. First, they need to place greater focus on services targeting small and large goods, as these two categories have proven to contribute more significantly to shipping volumes. Warehouse system optimization, distribution route determination, and pricing strategies need to be tailored to the characteristics of these two categories. Second, although the medium category is relatively smaller, this does not mean that this segment can be ignored. In fact, there are opportunities for innovation to develop specialized services that can attract customers in the medium category, such as competitive rates, bundling options, or additional services such as packaging services to improve security (Yulientinah & Siregar, 2021).

Thus, Figure 1 shows that the pattern of goods delivery in Indonesia reflects two main poles of logistics needs, namely small goods to meet the high demand for retail e-commerce and large goods to support industrial distribution. Medium goods are in a lower position, but remain important as a market potential that can be optimized. For logistics players, understanding this trend is very important for formulating the right business strategy,

improving operational efficiency, and ultimately increasing customer satisfaction in all segments.

### **Problem Formulation**

Based on the background of the problem above, the following problems were formulated in this literature review: 1) Does warehouse management affect customer satisfaction in goods delivery services?; 2) Does e-commerce technology affect customer satisfaction in goods delivery services?; and 3) Do external factors affect customer satisfaction in goods delivery services?

### **METHOD**

This study uses a qualitative design with a descriptive approach based on a literature review. This approach was chosen because it allows researchers to investigate, understand, and critically analyze the factors that influence customer satisfaction in goods delivery services through a synthesis of previous studies. The literature review method not only focuses on presenting a summary of findings, but also conducts a comparative evaluation to identify similarities, differences, and patterns of interrelationships between variables. Thus, this study can produce stronger and evidence-based theoretical arguments and contribute to the development of scientific studies in the field of marketing and logistics management, (Boulton, M. J., & Houghton, 2021).

The research data was sourced from secondary data obtained through journal articles, digital books, research reports, and academic publications relevant to the variables of warehouse management, e-commerce technology, external factors, and customer satisfaction. The literature was collected from reputable international databases such as Scopus, Web of Science, Taylor & Francis, Emerald, Sage, Springer, Elsevier, DOAJ, and EBSCO. In addition, additional searches were conducted through Google Scholar to ensure broader literature coverage. The selection of literature was carried out systematically by considering the suitability of the topic, the quality of the publication, and its relevance to the research focus, (Susanto, Arini, et al., 2024).

Data analysis was conducted using a comparative analysis approach. In the first stage, the literature obtained was reduced to ensure that only articles that met the criteria were used. The next stage was data presentation, in which previous research findings were arranged in a matrix or summary table to facilitate the comparison process. The analysis then focused on identifying similarities, differences, and patterns of relationships between variables. The final stage was drawing conclusions through synthesizing the analysis results to obtain a comprehensive understanding of the influence of warehouse management, e-commerce technology, and external factors on customer satisfaction in goods delivery services, (Dewi, 2024).

The validity of the research is maintained through the selection of literature sources from reputable international academic databases, as well as the screening of articles based on their relevance to the context and substance of the research. The reliability of the research is strengthened by the use of various sources from diverse geographical contexts and industrial sectors, so that the results of the analysis are not only partial but can provide a more general picture. With this approach, the research results have academic credibility and can be accounted for in the development of literature in the field of logistics management and service marketing.

## RESULT AND DISCUSSION

Based on the background and formulation of the problem above, the literature review in this study is as follows:

### Customer Satisfaction in Goods Delivery Services

Customer satisfaction in freight forwarding services is a psychological condition that arises after customers compare their expectations with their actual experience of the quality of the freight forwarding services they receive. In the context of logistics and distribution, customer satisfaction is not only determined by delivery speed, but also includes timeliness, security of goods, affordability, ease of access to services, and quality of communication with service providers. If customers receive services that meet or exceed their expectations, they will feel satisfied, which will strengthen their loyalty and increase the likelihood of repeat use of the service, (Mulyono et al., 2023).

Indicators or dimensions included in the customer satisfaction variable in goods delivery services include: 1) Delivery Speed: The extent to which goods can be delivered and received according to the estimated time or even faster than promised; 2) Goods Security: The level of protection of goods from damage, loss, or misdelivery during the delivery process; 3) Affordability: The suitability of delivery costs to the quality of service received by customers; 4) Customer Service Quality: The ability of service providers to provide clear information, friendly service, and quick responses to customer complaints or inquiries, (Hasdiansa & Hasbiah, 2023).

Customer satisfaction variables in freight forwarding services are relevant to previous research conducted by: (Mahsyar & Surapati, 2020), (Uvet, 2020), (Koay et al., 2022).

### Warehouse Management

Warehouse management is a series of systematic processes that include receiving, storing, controlling, and distributing goods in storage facilities to ensure efficient and effective logistics flows. Warehouses play an important role in the supply chain as they connect producers with consumers through optimal inventory management. Warehouse management is not just about organizing goods, but also includes the use of inventory management systems, layout arrangements, product quality maintenance, and the application of digital technologies such as Warehouse Management Systems (WMS), (Torabizadeh et al., 2020).

Indicators or dimensions found in warehouse management variables include: 1) Inventory Accuracy: The accuracy of stock data in the warehouse with actual conditions, which minimizes recording and delivery errors; 2) Layout and Process Efficiency: The arrangement of storage space and workflow that supports the speed of loading and unloading, storage, and distribution of goods; 3) Goods Quality Maintenance: The ability to maintain products in accordance with standards, free from damage, and suitable for consumption/use; 4) Technology Utilization: The use of a Warehouse Management System (WMS) or digitalization to improve the effectiveness of goods control and distribution, (Jarašūnienė et al., 2023).

Warehouse management variables are relevant to previous research conducted by: (Istiqomah et al., 2020), (Maheshwari et al., 2024), (Popović et al., 2021).

### E-Commerce Technology

E-commerce technology is the use of digital technology to support electronic buying and selling transactions, from product ordering and payment to distribution of goods and after-sales service. This technology includes the use of online platforms, mobile applications, digital payment systems, big data technology, and integration with logistics and warehouse management services. In the context of goods delivery services, e-commerce technology plays an important role in connecting sellers, consumers, and logistics service providers in real time, (Riswandi & Permadi, 2022).



Indicators or dimensions found in e-commerce technology variables include: 1) Ease of Platform Access: The extent to which consumers can use applications/websites with simple, fast, and secure interfaces; 2) Logistics System Integration: The ability of e-commerce systems to connect with delivery services, goods tracking, and warehouse management in real time; 3) Payment Flexibility: The availability of various digital payment methods that are secure, practical, and suit customer preferences; 4) Information Reliability: The accuracy of information related to product availability, order status, and delivery estimates displayed to consumers (Yadav et al., 2022).

E-commerce technology variables are relevant to previous research conducted by: (Dutta & Shivani, 2023), (Ardiansah et al., 2020), (Esfahbodi et al., 2022).

### External Factors

External factors are variables beyond the direct control of the company that can affect service performance, customer satisfaction, and the smooth running of logistics operations. In the context of freight delivery services, external factors include economic conditions, government regulations, transportation infrastructure, trade policies, industry competition, and social and environmental conditions such as natural disasters or pandemics. External factors can be both opportunities and threats for logistics companies (Regue & Regue, 2024).

Indicators or dimensions contained in external factors include: 1) Infrastructure Conditions: The quality of roads, ports, airports, and transportation facilities that affect the smooth distribution of goods; 2) Government Regulations and Policies: Rules related to trade, logistics, taxation, and safety standards that impact company operations; 3) Economic and Social Dynamics: Fluctuations in fuel prices, purchasing power, or consumer behavior trends that affect demand for delivery services; 4) Environmental and Disaster Factors: The effects of extreme weather, pandemics, or natural disasters that can disrupt logistics and distribution processes (Duc et al., 2021).

External factors are relevant to previous research conducted by: (Diem et al., 2021), (Kukartsev et al., 2023), (Hasfar et al., 2020).

### Previous Research

Based on the above findings and previous studies, the research discussion is formulated as follows:

**Table 1. Results of Previous Relevant Research**

No	Author (Year)	Research Results	Similarities With This Article	Differences With This Article	Hypotesis
1	(Kristanto & Padmakusumah, 2025)	Lean Variables and Warehouse Management Affect Customer Satisfaction in Goods Delivery Services	This article examines warehouse management variables as independent variables and customer satisfaction with goods delivery services as dependent variables.	The difference with previous studies lies in the Lean variable as another independent variable.	H1
2	(Sabila & Kusumaningrum, 2020)	E-commerce technology variables and e-commerce service quality affect customer satisfaction with goods delivery services.	This article examines the e-commerce technology variable as an independent variable and examines the customer satisfaction variable in goods delivery services as a dependent variable.	The difference with previous studies lies in the variable of e-commerce service quality as another independent variable.	H2

3	(Aini et al., 2025)	Variables such as service quality, delivery punctuality, price, tracking system, supporting facilities, and external factors affect customer satisfaction in goods delivery services.	This article has similarities in examining external factors in its independent variables and examining customer satisfaction variables in goods delivery services in its dependent variables.	The difference with previous studies lies in the variables of service quality, delivery punctuality, price, tracking system, and supporting facilities as other independent variables.	H3
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## Discussion

Based on the problem formulation and relevant previous research, the discussion in this literature review is as follows:

### 1. The Effect of Warehouse Management on Customer Satisfaction in Goods Delivery Services

Based on a literature review and relevant previous studies, it can be stated that warehouse management affects customer satisfaction in goods delivery services.

To improve customer satisfaction in goods delivery services through warehouse management, every company or organization must do the following: 1) Inventory accuracy: Companies must ensure that inventory data is always accurate and real-time through a warehouse management system. High inventory accuracy prevents stockouts or excess stock, which can cause delivery delays or order cancellations. 2) Layout and process efficiency: Companies need to design an ergonomic and logical warehouse layout based on principles such as popularity-based storage (ABC analysis), optimizing goods movement routes to minimize travel time, and implementing a systematic placement system (such as bin location); 3) Maintain product quality: Companies need to ensure that products remain in good condition, free from damage, and fit for consumption/use. This is very important because poor product quality will reduce customer confidence in delivery services; 4) Utilize technology: Companies must adopt an integrated Warehouse Management System (WMS) to automate and monitor all warehouse operations. Other technologies such as automated guided vehicles (AGVs) for moving goods, drones for stock-taking, and Internet of Things (IoT) sensors for monitoring storage conditions can significantly improve the accuracy, speed, and reliability of operations.

If every company or organization can provide or pay attention to inventory accuracy, layout and process efficiency, quality maintenance, and technology utilization, it will have a positive effect on customer satisfaction in goods delivery services, including: 1) Delivery speed: Layout and process efficiency supported by technology and inventory accuracy enable faster order picking and packing processes. When orders can be processed immediately after receipt, the customer's delivery lead time is shortened. This speed meets the basic expectations of customers in this instant era and is a determining factor in logistics service competition; 2) Product safety: Maintaining product quality in the warehouse ensures that products arrive in the hands of customers in good condition, without defects, damage, or expiration. This builds trust and reduces costs and inconveniences arising from damaged goods, such as returns and replacements; 3) Cost affordability: Efficient warehouse management ultimately reduces operational costs. Reduced costs include labor, storage, and error costs. These savings can be passed on to customers in the form of more competitive shipping costs without compromising service quality; 4) Customer service quality: With accurate data from WMS, companies can provide real-time information to customers regarding order status and stock availability. Customer service becomes more informative, responsive, and reliable, which ultimately increases customer loyalty.

The results of this study are in line with previous studies conducted by (Primadi & Tohir, 2023), (Deswanto et al., 2025), (Kristanto & Padmakusumah, 2025), which states that there is a relationship between warehouse management and customer satisfaction in goods delivery services.

## **2. The Impact of E-Commerce Technology on Customer Satisfaction in Goods Delivery Services**

Based on a literature review and relevant previous studies, it has been stated that e-commerce technology affects customer satisfaction in goods delivery services.

To improve customer satisfaction in goods delivery services through e-commerce technology, every company or organization must do the following: 1) Ease of platform access: Companies must develop e-commerce platforms that are not only aesthetically appealing, but also functional and easy to navigate (user-friendly); 2) Logistics system integration: This critical aspect requires e-commerce platforms to be integrated in real-time with warehouse management systems (WMS) and logistics partners or courier services. This integration enables seamless data exchange, from stock availability confirmation, automatic order processing, pickup scheduling, to instant receipt number generation; 3) Payment flexibility: To reach the widest possible customer segment, companies must offer a variety of payment methods that can be tailored to customer preferences and financial capabilities; 4) Reliability of information: Reliability of information refers to the presentation of accurate, consistent, and transparent data throughout all stages of the process. This starts with detailed product information (high-resolution images, clear specifications, comprehensive descriptions), real-time stock availability, realistic delivery time estimates, to detailed and updated tracking information.

If every company or organization can provide or pay attention to platform accessibility, logistics system integration, payment flexibility, and information accessibility, it will have a positive effect on customer satisfaction in goods delivery services, which include: 1) Delivery speed: When orders are immediately entered into the warehouse system after payment is confirmed, the picking and packing process can begin immediately. Additionally, with reliable information about the location of inventory in the warehouse, the efficiency of this process is further increased; 2) Goods security: The reliability of tracking information allows customers to monitor the journey of their goods, so they can ensure that someone is at home to receive the package, avoiding abandonment of packages in unsafe places, which could potentially cause loss or damage; 3) Affordability: Payment flexibility, particularly paylater options, also increases affordability by providing financial leeway, making higher-value products more accessible without burdening customers' monthly budgets all at once; 4) Customer service quality: When issues arise, system integration allows customer service to have full visibility of customer orders, enabling them to provide quick and accurate solutions. Easy platform access, such as a helpdesk portal and intelligent chatbots, ensures that customer support is available, improving overall responsiveness and satisfaction.

The results of this study are in line with previous studies conducted by (Sabila & Kusumaningrum, 2020), (Wulandary et al., 2023), which states that there is a relationship between e-commerce technology and customer satisfaction in goods delivery services.

## **3. The Influence of External Factors on Customer Satisfaction in Goods Delivery Services**

Based on a review of the literature and relevant previous studies, it can be stated that external factors influence customer satisfaction in goods delivery services.

To improve customer satisfaction in freight forwarding services through external factors, every company or organization must do the following: 1) Infrastructure conditions: Companies must use route optimization systems that are integrated with real-time traffic data and road



conditions to identify and avoid bottlenecks. In addition, diversifying modes of transportation or developing strategic micro-hubs near densely populated areas can reduce dependence on vulnerable road infrastructure; 2) Government regulations and policies: Companies must have a proactive compliance team that continuously monitors and integrates regulatory changes into their operational systems, ensuring that delivery schedules are adjusted immediately. In international services, digitizing customs processes and collaborating closely with relevant authorities can expedite clearance and minimize unexpected delays; 3) Economic and social dynamics: To address cost issues, companies need to implement careful cost-to-serve analysis to offer the most affordable delivery options; 4) Environmental and disaster factors: Companies must develop a Comprehensive Contingency Plan that includes mapped alternative routes, regional backup warehouses, and an early warning system integrated with weather information. Transparent and rapid communication with customers in the event of a disruption is key to maintaining trust.

If every company or organization can provide or pay attention to infrastructure conditions, government regulations and policies, economic and social dynamics, environmental and disaster factors, it will have a positive effect on customer satisfaction in freight delivery services, which include: 1) Delivery speed: Adapting to infrastructure conditions (through route optimization) and mitigating environmental/disaster factors (through contingency plans) directly minimizes unexpected delays. This ensures more consistent and reliable delivery speeds, even amid external challenges; 2) Goods security: Proactive attention to economic and social dynamics and mitigation of environmental/disaster factors is vital. These measures effectively reduce the risk of loss, damage, or looting during transit, ensuring the safety of goods until they reach the customer; 3) Cost affordability: Strict and proactive compliance with government regulations and policies prevents large fines and penalties, while route optimization due to difficult infrastructure conditions reduces operational costs; 4) Customer service quality: Customer service quality is significantly improved through transparency and communication. When delays occur due to sudden regulations or natural disasters, adaptation strategies enable companies to provide accurate, timely, and honest information about the causes of delays and new ETAs. This proactive response builds customer trust and empathy, which is at the heart of superior customer service, even when delivery times are disrupted by factors beyond the company's control.

The results of this study are in line with previous studies conducted by (Aini et al., 2025), which states that there is an influence between external factors and customer satisfaction in goods delivery services.

### Conceptual Framework

The conceptual framework is determined based on the problem formulation, research objectives, and previous studies relevant to the discussion in this literature review:

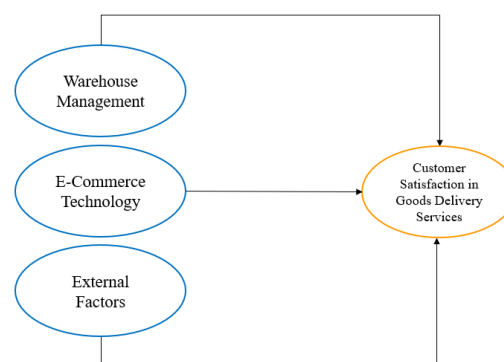


Figure 2. Conceptual Framework

Based on Figure 2 above, warehouse management, e-commerce technology, and external factors influence customer satisfaction in goods delivery services. However, in addition to the variables of warehouse management, e-commerce technology, and external factors that influence customer satisfaction in goods delivery services, there are other variables that influence it, including:

- 1) Service Quality: (Yuliamir et al., 2023), (Agarwal & Gowda, 2021), (Susanto, Mahaputra, et al., 2024), (Saputro et al., 2020).
- 2) Service Tariff: (Dong & Kouvelis, 2020), (Ferdani et al., 2020), (Novirani & Adiarto, 2020), (Anjani, 2024).
- 3) Reliability: (Wulan et al., 2024), (Samsir, 2020), (Nurfitasari, 2020), (Soetanto, 2021), (Darunanto et al., 2024).

## CONCLUSION

Based on the problem formulation, results, and discussion above, the conclusion of this literature review research is as follows: 1) Warehouse management affects customer satisfaction in goods delivery services; 2) E-commerce technology affects customer satisfaction in goods delivery services; and 3) External factors affect customer satisfaction in goods delivery services.

## REFERENCES

- Abdelaziz, S., & Munawaroh, M. (2025). Unveiling the Landscape of Sustainable Logistics Service Quality: A Bibliometric Analysis. *Jurnal Optimasi Sistem Industri*, 23(2), 227–265. <https://doi.org/10.25077/josi.v23.n2.p227-265.2024>
- Agarwal, I., & Gowda, K. R. (2021). The effect of airline service quality on customer satisfaction and loyalty in India. *Materials Today: Proceedings*, 37, 1341–1348.
- Aini, N. F., Darmansyah, D., Apriyono, R., Ramdhani, R., & Prastyo, Y. (2025). Literature review: faktor-faktor yang mempengaruhi kepuasan pelanggan dalam layanan pengiriman barang. *Deleted Journal*, 2(4), 2305–2314. <https://doi.org/10.70248/jmie.v2i4.2330>
- Almadina, N., & Badriyah, S. M. (2023). Dampak Pengurangan Aktivitas Pelabuhan Peti Kemas Semarang Dengan Pelabuhan Ning-Bo China Terhadap Pelaksanaan Perjanjian Pengangkutan Ekspor-Impor. *Jurnal Pembangunan Hukum Indonesia*, 5(1), 103–119. <https://doi.org/10.14710/jphi.v5i1.103-119>
- Anjani, Y. (2024). Optimalisasi Tarif Layanan dengan Memperbaiki dan Meningkatkan Kualitas Pelayanan di Loka Litbangkes Pangandaran. *Owner: Riset Dan Jurnal Akuntansi*, 8(2), 1576–1587.
- Ardiansah, M. N., Chariri, A., & Rahardja, S. (2020). The effect of electronic payments security on e-commerce consumer perception: An extended model of technology acceptance. *Management Science Letters*, 10(7), 1473–1480.
- Boulton, M. J., & Houghton, C. (2021). The Role of the Researcher in Qualitative Research: A Critical Reflection. *International Journal of Qualitative Methods*, 20, 1–12.
- Darunanto, D., Honny, H., Subandi, S., & Saidah, D. (2024). Determinasi Loyalitas Pelanggan: Analisis Keandalan, Fasilitas dan Kepuasan Pelanggan Kereta Api. *Jurnal Ekonomi Manajemen Sistem Informasi (JEMSI)*, 5(5).
- Deswanto, N. A., Kristian, Y., Yudho, V., Wardana, F. M. K., & Limantara, A. D. (2025). EVALUASI KINERJA LAYANAN LOGISTIK DENGAN METODE KEY PERFORMANCE INDICATOR (KPI) DALAM PENGELOLAAN DISTRIBUSI BARANG PADA JNT CARGO KEDIRI. *Prosiding Simposium Nasional Manajemen Dan Bisnis*, 4, 1596–1601.

- Dewi, M. (2024). *Metode Penelitian Research is Fun* (A. Ambiyar (ed.); 1st ed.). CV. Muharika Rumah Ilmiah.
- Diem, P. T., Duc, N. M., & Hong, T. T. K. (2021). Factors impacting customer satisfaction at VinMart supermarkets in Vietnam. *International Journal of Research in Human Resource Management*, 3(2), 53–61.
- Dong, L., & Kouvelis, P. (2020). Impact of tariffs on global supply chain network configuration: Models, predictions, and future research. *Manufacturing & Service Operations Management*, 22(1), 25–35.
- Duc, N. M., Chi, D. T. P., Tien, N. H., & Hong, T. T. K. (2021). Factors affecting customer satisfaction at Vietinbank in Vietnam. *International Journal of Research in Human Resource Management*, 3(2), 62–70.
- Dutta, S., & Shivani, S. (2023). Acceptance and use of e-commerce technology among female entrepreneurs of micro and small businesses in India: analysis of determinants. *International Journal of Business Innovation and Research*, 31(3), 356–377.
- DwiNov, D. A., Kusmayati, N. K., & Wihara, D. S. (2025). Pengaruh Ketepatan Pengiriman Dan Kualitas Pelayanan Terhadap Kepuasan Pelanggan. *Journal of Artificial Intelligence and Digital Business*, 4(2), 525–530. <https://doi.org/10.31004/riggs.v4i2.508>
- Erfan, E., & Chubirka, N. (2024). Factors of intensification of international business in the field of transport and logistics services. *Naukovij Visnik Užgorods'kogo Nacional'nogo Universitetu*, 52. <https://doi.org/10.32782/2413-9971/2024-52-8>
- Esfahbodi, A., Pang, G., & Peng, L. (2022). Determinants of consumers' adoption intention for blockchain technology in E-commerce. *Journal of Digital Economy*, 1(2), 89–101.
- Ferdani, A. R., Wahab, Z., Shihab, M. S., & Widiyanti, M. (2020). *International Journal of Social Sciences*, 3(1), 90–99.
- Hasdiansa, I. W., & Hasbiah, S. (2023). The Effect of Service Quality on Customer Satisfaction Using Goods Delivery Services in Makassar City. *Fundamental and Applied Management Journal*, 1(1), 5–12.
- Hasfar, M., Militina, T., & Achmad, G. N. (2020). Effect of customer value and customer experience on customer satisfaction and loyalty PT meratus samarinda. *International Journal of Economics, Business and Accounting Research (IJEBAAR)*, 4(01).
- Hidayat, V. S., Agustina, L., Tjun, L. T., Lingga, I. S., Carolina, Y., SeTin, S., Marpaung, E. I., & Susilawati, C. D. K. (2024). Accounting Digitalization Innovation for MSME Success: Financial Statement Preparation Training. *Jurnal Pengabdian Pada Masyarakat*, 9(4), 908–914.
- Istiqomah, N. A., Sansabilla, P. F., Himawan, D., & Rifni, M. (2020). The implementation of barcode on warehouse management system for warehouse efficiency. *Journal of Physics: Conference Series*, 1573(1), 12038.
- Jarašūnienė, A., Čižiūnienė, K., & Čereška, A. (2023). Research on impact of IoT on warehouse management. *Sensors*, 23(4), 2213.
- Koay, K. Y., Cheah, C. W., & Chang, Y. X. (2022). A model of online food delivery service quality, customer satisfaction and customer loyalty: a combination of PLS-SEM and NCA approaches. *British Food Journal*, 124(12), 4516–4532.
- Kristanto, R. W., & Padmakusumah, R. R. (2025). PENGARUH IMPLEMENTASI LEAN DAN WAREHOUSE MANAGEMENT SYSTEM TERHADAP KINERJA LOGISTIK PADA INDUSTRI FMCG PT. XYZ. *Jurnal Ilmiah Manajemen, Ekonomi, & Akuntansi (MEA)*, 9(1), 547–566.

- Kukartsev, V., Nelyub, V., Kozlova, A., Borodulin, A., & Rukosueva, A. (2023). Intelligent data analysis as a method of determining the influence of various factors on the level of customer satisfaction of the company. In *Proceedings of the Computational Methods in Systems and Software* (pp. 109–128). Springer.
- Maheshwari, P., Kamble, S., Kumar, S., Belhadi, A., & Gupta, S. (2024). Digital twin-based warehouse management system: a theoretical toolbox for future research and applications. *The International Journal of Logistics Management*, 35(4), 1073–1106.
- Mahsyar, S., & Surapati, U. (2020). Effect of service quality and product quality on customer satisfaction and loyalty. *International Journal of Economics, Business and Accounting Research (IJEBAAR)*, 4(01).
- Manapure, J. S. (2024). *Freight management system: rightways air logistics solution*. <https://doi.org/10.69758/gimrj2406i8v12p053>
- Moussaoui, A. E. El, Benbba, B., Jaegler, A., Andaloussi, Z. El, & Amrani, L. El. (2022). *Last Mile Logistics: Challenges & Improvement Ways*. 1–7. <https://doi.org/10.1109/LOGISTIQUA55056.2022.9938101>
- Mulyono, H., Fikri, M. H., & Syamsuri, A. R. (2023). Servicecape Analysis To Customer Satisfaction In Delivery Service Company With Customer Trust As Intervening Variable. *Jurnal Manajemen Industri Dan Logistik*, 7(1), 1–10.
- Novirani, D., & Adiinto, H. (2020). Relation of service quality, load factors and tariff on bus city of Bandung. *International Review of Management and Marketing*, 10(4), 152.
- Nurfitasari, E. (2020). *PENGARUH BUKTI FISIK, KEANDALAN, DAYA TANGGAP, EMPATI DAN JAMINAN TERHADAP KEPUASAN KONSUMEN PADA HOTEL SURYA DHARMA LOROK PACITAN*. Universitas Muhammadiyah Ponorogo.
- Popović, V., Kilibarda, M., Andrejić, M., Jereb, B., & Dragan, D. (2021). A new sustainable warehouse management approach for workforce and activities scheduling. *Sustainability*, 13(4), 2021.
- Pratama, J. (2024). *Potensi UMKM dan Keputusan dalam Memilih Jasa Pengiriman Barang*. <https://www.markplusinc.com/featured-insights/publications/potensi-umkm-dan-keputusan-dalam-memilih-jasa-pengiriman-barang>
- Primadi, A., & Tohir, M. (2023). Analisis Pengaruh Penerapan Manajemen Logistik, Kualitas Pelayanan dan Kecepatan Pengiriman Dalam Mendukung Efisiensi Biaya Logistik. *Jurnal Pendidikan Siber Nusantara*, 1(4), 173–179.
- Regue, Z., & Regue, H. M. (2024). The correlation between internal and external customer satisfaction as a tool for activating service marketing in small and medium enterprises. *International Journal of Professional Business Review: Int. J. Prof. Bus. Rev.*, 9(10), 1.
- Riswandi, R., & Permadi, I. (2022). Business sustainability through technology adoption: Readiness and acceptance of e-commerce technology in MSMEs. *KnE Social Sciences*, 243–256.
- Sabila, A. R., & Kusumaningrum, L. (2020). Analisis kualitas layanan e-commerce SHOPEE dalam meningkatkan kepercayaan dan kepuasan pelanggan (studi kasus: pelanggan shopee di kota tangerang 2020). *Jl-Tech*, 72–80.
- Samsir, N. (2020). *Pengaruh Keandalan Dan Daya Tanggap Terhadap Kepuasan Konsumen Pada Pengguna Jasa Di Mahakarya Photography*. UNIVERSITAS NEGERI MAKASSAR.
- Saputro, F. G., Sasono, A. D., Suyono, J., Elisabeth, D. R., & Bin Bonn, A. T. (2020). The Effect Of Customer Relationship Marketing And Service Quality On Customer Retention With Customer Satisfaction As A Mediating Variable In Forwarding Companies In Surabaya. *IJEED (International Journal of Entrepreneurship and Business Development)*, 3(4), 470–478. <https://doi.org/10.29138/ijeed.v3i4.1217>

- Soetanto, S. (2021). Pengaruh Kualitas Produk, Keandalan Pengiriman, Dan Promosi Penjualan Terhadap Kepuasan Pelanggan Online Shop Di Instagram. *PERFORMA*, 6(2), 124–132.
- Susanto, P. C., Arini, D. U., Yuntina, L., & Panatap, J. (2024). Konsep Penelitian Kuantitatif : Populasi , Sampel , dan Analisis Data ( Sebuah Tinjauan Pustaka ). *Jurnal Ilmu Manajemen*, 3(1), 1–12. <https://doi.org/https://doi.org/10.38035/jim.v3i1>
- Susanto, P. C., Mahaputra, M. R., & Mahaputra, M. R. (2024). Service Quality and Customer Satisfaction Have an Impact on Increasing Hotel Room Occupancy Ratio: Literature Review Study. *Greenation International Journal of Tourism and Management*, 1(4), 400–412.
- Torabizadeh, M., Yusof, N. M., Ma'aram, A., & Shaharoun, A. M. (2020). Identifying sustainable warehouse management system indicators and proposing new weighting method. *Journal of Cleaner Production*, 248, 119190.
- Uvet, H. (2020). Importance of logistics service quality in customer satisfaction: An empirical study. *Operations and Supply Chain Management: An International Journal*, 13(1), 1–10.
- Verma, N. (2025). Logistics and Warehouse Management Challenges of Amazon. *International Scientific Journal of Engineering and Management*, 04(06), 1–9. <https://doi.org/10.55041/isjem04615>
- Wulan, I., Safuan, S., & Erwin, E. (2024). Tinjauan Pustaka Dampak Keandalan E-Servqual Terhadap Kepuasan Pelanggan Dalam E-Commerce. *Jesya (Jurnal Ekonomi Dan Ekonomi Syariah)*, 7(2), 1911–1925.
- Wulandary, E., Mas' ud, M., & Ashoer, M. (2023). Pengaruh Kualitas Layanan Era Digitalisasi Media Pemasaran Online E-Commerce dengan Menggunakan E-Service Quality Untuk Mengetahui Kepuasan Pelanggan. *Center of Economic Students Journal*, 6(1), 44–59.
- Yadav, H., Soni, U., Gupta, S., & Kumar, G. (2022). Evaluation of barriers in the adoption of E-commerce technology in SMEs: A fuzzy DEMATEL approach. *Journal of Electronic Commerce in Organizations (JECO)*, 20(1), 1–18.
- Yuliamir, H., Hadi, S., Rahayu, E., & Palupiningtyas, D. (2023). The Role of Satisfaction in Mediating the Influence of Service Quality, Customer Experience, and Trust on Consumer Loyalty of 4 Star Hotels in Semarang City. *Jurnal Manajemen Perhotelan Dan Pariwisata*, 6(1), 42–53.
- Yulientinah, D. S., & Siregar, S. A. (2021). Pengaruh Sistem Informasi Akuntansi Persediaan Terhadap Pengendalian Internal Persediaan Pada Pt Trijati Primula. *Land Journal*, 2(1), 54–64. <https://doi.org/10.47491/landjournal.v2i1.1054>