DIJEFA: Dinasti International Journal of Economics, Finance & Accounting
E-ISSN: 2721-303X
P-ISSN: 2721-3021
https://dinastipub.org/DIJEFA dinasti.info@gmail.com +62 811 7404 455

DOI: https://doi.org/10.38035/dijefa.v6i3.4590
https://creativecommons.org/licenses/by/4.0/
Received: 22 April 2025 | **Revised:** 04 June 2025 | **Accepted:** 18 June 2025

Implementation of Transportation, Warehouse and Distribution to Supply Chain Management: Study Literature Review

Andri Primadi[1*], Euis Saribanon[2], Yuliantini[3], Nashrullah[4], Muhammad Tohir[5]
[1]Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia, andriprimadi_ok@yahoo.com
[2]Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia, easynon_e@yahoo.com
[3]Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia, yuliantini.mami@gmail.com
[4]Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia, irul033029@gmail.com
[5]Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia, mtohir817@gmail.com

[*]Corresponding Author: andriprimadi_ok@yahoo.com[1]

Abstract: The article on the implementation of transportation, warehouse and distribution on supply chain management is an article within the scope of operational management science. The purpose of this study is to build a hypothesis regarding the influence between variables that can later be used for further research within the scope of operational management. The research method used is descriptive qualitative. The data collection technique uses literature studies/literature reviews. Data were obtained from previous studies that are relevant to this study and sourced from academic online media such as Publish or Perish, Google Scholar, Jurnal Sinta, DOAJ and Garuda. The results of this study are as follows: 1) Transportation affects supply chain management; 2) Warehouses affect supply chain management; and 3) Distribution affects supply chain management.

Keywords: Supply Chain Management, Transportation, Warehouse, Distribution.

INTRODUCTION

Supply chain management (SCM) has become one of the most important parts of modern corporate operations. This is owing to the rising complexity of global supply chains, which require organizations to engage with a global network of suppliers, manufacturers, distributors, and customers. In this setting, good transportation, warehousing, and distribution practices are critical to ensure smooth supply chain operations. Transportation, as one of the key aspects, is the transportation of things from their point of origin to their point of destination. This includes not just delivering finished items to clients, but also transporting raw materials to manufacturing facilities and distributing products between warehouses. Transportation efficiency has a significant impact on operational expenses and the speed with which markets respond to demand. Companies that optimize their transportation routes can save money and time, boost customer satisfaction, and gain a competitive advantage (Prabowo & Nasito, 2023).

Warehouses, the second component of this trio, function as storage and stock management facilities. Warehouses are used not simply to store commodities, but also for

consolidation, deconsolidation, repackaging, and other value-added activities. Warehouse efficiency has a direct impact on market inventory levels and product availability. A well-managed warehouse may cut storage costs, shorten storage times, and ensure that commodities are available when customers need them. This necessitates a comprehensive warehouse management system that provides for real-time inventory tracking, appropriate storage layouts, and effective collaboration with other supply chain departments (Alexander & Pujawan, 2024).

Distribution, as the third component, connects production to the end user. It encompasses all activities involved in transporting products from the warehouse to the final client. Effective distribution ensures that products are supplied at the appropriate time and location based on market demand. Poor distribution techniques can result in delayed delivery, unequal product availability, and expensive distribution expenses. To attain optimum efficiency, businesses must build an effective distribution network, choose the appropriate distribution channels, and optimize delivery routes. In this digital era, information technology is critical to the integration and coordination of transportation, warehousing, and distribution. ERP (Enterprise Resource Planning) and WMS (Warehouse Management System) systems provide end-to-end insight across the supply chain, from raw material procurement to product delivery. Companies that use precise and real-time data can make better and faster decisions, minimize errors, and increase overall operational efficiency. Furthermore, technologies like IoT (Internet of Things), AI (Artificial Intelligence), and blockchain are becoming more commonly used to improve supply chain transparency, reliability, and security (Ariani, 2023).

However, there are other obstacles associated with integrating transportation, warehousing, and distribution. Fluctuations in demand, regulatory changes, volatile economic situations, and natural dangers are examples of external factors that might disrupt operations. Internal challenges include departmental coordination, limited resources, and technology capabilities. As a result, firms must have an adaptable and flexible strategy, as well as the capacity to plan and manage risks effectively. For example, in terms of transportation, businesses must assess the numerous modes of transit available and select the one that best meets their needs. The advantages and disadvantages of land, sea, and air transportation modalities are all distinct. Land transportation may be more cost-effective over short distances, but it takes longer. Air transportation is faster but more expensive, whereas sea transportation is better suited for large and heavy shipments but takes longer. By taking all of these aspects into account, businesses may create the most efficient and effective transportation option (Susanto, Pahala, et al., 2021).

Companies must ensure that their warehouses have enough capacity to handle commodities as needed. The use of technology, such as warehouse management systems combined with RFID (Radio Frequency Identification) technology, can aid in real-time inventory tracking, lowering the risk of loss or surplus stock. Furthermore, optimal warehouse layout design can increase operational efficiency by reducing the time and expense required to choose and transfer goods. Companies in the distribution business must maintain an effective distribution network capable of reaching customers in a variety of places. This could include the utilization of regional distribution centers, coordination with third-party logistics service providers, and the use of technology to optimize delivery routes. In some situations, businesses may explore an omni-channel distribution model, which integrates many sales channels, both online and offline, to improve the consumer experience (Ricardianto et al., 2021).

Overall, successful implementation of transportation, warehousing, and distribution in supply chain management necessitates a comprehensive and integrated approach. Companies must have a clear vision, an effective strategy, and the ability to respond to market developments. In doing so, businesses may assure smooth operations, cut expenses, boost customer happiness, and, ultimately, gain a competitive advantage in an increasingly complicated and dynamic global economy. To accomplish this, businesses must invest in

technology, train their employees, and form strong partnerships with all parties in the supply chain. Furthermore, businesses must have the ability to respond swiftly to market changes and other external factors, as well as implement systems that allow improved visibility and control over all areas of their supply chain. With the appropriate attitude, businesses can transform supply chain management difficulties into opportunities for development and innovation.

Based on the background of the problem, the objectives of this study are: 1) To determine the implementation of transportation on supply chain management; 2) To determine the implementation of warehouses on supply chain management; and 3) To determine the implementation of distribution on supply chain management.

METHOD

The Literature Review essay is prepared through the utilization of Library Research and Systematic Literature Review (SLR) methodology. Evaluation of this approach is done using qualitative measures and can be accessed through academic websites such as Mendeley and Google Scholar. The methodology used in this study involves conducting a literature review to collect data. Qualitative data is obtained through a comprehensive examination of previously published research that is relevant to the current investigation. A systematic literature review, often known as SLR, is a methodical process of finding, evaluating, and analyzing all available research data to answer a specific research question. For qualitative analysis, it is essential to consistently apply the literature review in accordance with methodological assumptions. The main reason for conducting a qualitative analysis is the investigative nature of the study, (Ali, H., & Limakrisna, 2013), (Susanto, Arini, et al., 2024), (Susanto et al., 2025).

RESULTS AND DISCUSSION

Results

Supply Chain Management

Supply Chain Management (SCM) is the process of overseeing the movement of commodities, information, and money from raw material suppliers to end users. SCM includes actions such as planning and controlling all aspects of procurement, production, and distribution. The primary goals are to increase operational efficiency, lower costs, improve quality, and deliver more value to customers. Effective supply chain management necessitates coordination and collaboration among all parties involved, including suppliers, manufacturers, distributors, retailers, and customers (Mappesona et al., 2020).

Indicators or dimensions contained in supply chain management variables include: 1) Operational Efficiency: Indicates how well the supply chain process functions at a low cost. Indicators include overall supply chain cost, proportion of purchase cost, and logistics costs; 2) Delivery Reliability: This metric measures the consistency and precision with which products are delivered on time. Indicators include the percentage of on-time delivery and order correctness; 3) Agility: This metric measures the supply chain's capacity to respond to market changes and demand. Indicators include manufacturing cycle time, operational flexibility, and production adjustment capability, and 4) Supply Chain Visibility: Measures an organization's ability to monitor and oversee all supply chain activity. Indicators include the utilization of technology, data transparency, and system integration (Chong & Ali, 2021).

Supply chain management variables have been studied and are relevant to research conducted by: (Nofrialdi et al., 2023), (Prabowo & Nasito, 2023), (Prayetno & Ali, 2020), (Richardo et al., 2020), (Jaya et al., 2020).

Transportation

Transportation is a critical component of supply chain management since it involves the moving of commodities from one point to another. It encompasses several forms of transportation, including land, sea, air, and train. Efficient shipping is vital for ensuring that things arrive on schedule and in good shape. Furthermore, transportation expenses are one of the main components of total logistics costs, therefore optimization can result in significant cost savings. Good transportation management also includes selecting the best routes, managing the fleet, and tracking delivery performance (Simarmata et al., 2019).

Indicators or dimensions contained in the transportation variable include: 1) Transportation Cost: Measures the entire cost of transporting goods. Indicators include the cost per unit transported and the total transportation cost in relation to the total logistics cost; 2) Delivery Time: The time required to transport products from one location to another. Indicators include the average transit and delivery times relative to the aim; 3) Transportation Reliability: Determines the constancy of delivery according to the scheduled schedule. Indicators include the percentage of on-time deliveries and the frequency of delays; and 4) Fleet Utilization: Determines how effectively the transportation fleet is employed. Indicators include vehicle usage rate and loading ratio (Ulfah et al., 2020).

The transportation variable has been studied and is relevant to research conducted by: (Simarmata et al., 2017), (Susanto et al., 2023), (Susanto, Ricardianto, et al., 2021).

Warehouse

A warehouse is a facility that stores items until they are distributed to the next point in the supply chain. A warehouse serves multiple functions, including receiving, sorting, repackaging, and delivering items. A well-managed warehouse can assist reduce storage time, maximize space utilization, and boost operational efficiency. A sophisticated warehouse management system (WMS) enables businesses to track inventory in real time, optimize warehouse layouts, and ensure that commodities can be located and transferred quickly (Wahono & Ali, 2021).

Indicators or dimensions contained in the warehouse variable include: 1) Warehouse Utilization Rate: This metric measures how much available warehouse space is being used. The indicator is the percentage of warehouse capacity utilized; 2) Picking Speed: This metric measures the efficiency with which commodities are retrieved from storage sites. The indicators include the average pick-up time and pick accuracy; 3) Stock Error Rate: Determines the accuracy of stock records in relation to physical stock. The indicators are inventory error rate and stock audit frequency; and 4) Warehouse Operating Cost: The overall cost of operating a warehouse. The indicators include labor expenses, storage costs, and overhead expenditures (Martinetta, 2023).

The warehouse variable has been studied and is relevant to research conducted by: (Susanto, Sawitri, et al., 2024), (Kumar et al., 2023), (Senduk & Sitokdana, 2022), (Rafli, 2022).

Distribution

Distribution is the process of transporting goods from a warehouse to the final consumer or other points along the supply chain. Distribution encompasses all operations related to ensuring that items are available at the appropriate location and time in response to client demand. This can include a variety of distribution channels, such as direct distribution to consumers, retail distribution, or third-party distribution. An successful distribution plan guarantees that items reach the market at a low cost and in a timely manner, all while maintaining product quality. In the digital age, distribution now includes fulfilling e-commerce

orders, which necessitates effective integration of online technologies and physical operations (Nasruddin et al., 2022).

Indicators or dimensions contained in the distribution variable include: 1) Distribution Speed: Determines how soon things can be delivered from the warehouse to the final client. Indicators include typical delivery and transit times; 2) Customer Service Level: Indicates how well distribution matches customer expectations. Indicators include customer happiness, on-time delivery frequency, and order accuracy; 3) Distribution Cost: Determines the total costs of distributing the goods. Indicators include distribution cost per unit and overall distribution cost in relation to sales; and 4) Route Efficiency: This metric determines how efficient the distribution routes used are. Indicators include the average distance traveled per delivery and vehicle usage rate (Sahara & Saputra, 2023).

Distribution variables have been studied and are relevant to research conducted by: (Prihantono, 2018), (Sahara & Saputra, 2023), (Nasruddin et al., 2022).

Relevant Previous Research

Reviewing related publications as a basis for formulating research hypotheses by describing previous research findings, highlighting similarities and differences with the research proposal, as illustrated in table 1 below:

Table 1. Relevant Previous Research Results

No	Author (Year)	Research Results	Similarities with this article	Differences with this article	Basic Hypothesis
1.	(Soekirman, 2024)	Logistics providers, intermodal transportation, information technology and government regulations influence supply chain management.	The influence of transportation on supply chain management	The influence of logistics providers, information technology and government regulations on supply chain management	H1
2.	(Kartikasari et al., 2021)	Effectiveness of transportation and location on logistics distribution or supply chain management in the Indonesian Navy Fleet Command Area I	The influence of transportation on supply chain management	The influence of location on supply chain management	H1
3.	(Ilham & Yofinaldi, 2024)	Warehouse influences supply chain management	The influence of warehouse on supply chain management	This study states that the warehouse has a very significant influence on inventory levels.	H2
4.	(Alexander & Pujawan, 2024)	OCR technology-based warehouses have an impact on the effectiveness and efficiency of supply chain management.	The influence of warehouse on supply chain management	This study examines OCR-based warehouse	H2
5.	(Abdul & Evitha, 2019)	E-business based distribution network design for supply chain management systems	The influence of distribution on supply chain management	This study examines e-business based distribution networks.	H3

Discussion

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

The Impact of Transportation on Supply Chain Management

Transportation is an important aspect of supply chain management, influencing everything from cost to delivery time, transportation reliability, and fleet utilization. These four characteristics directly affect operating efficiency, delivery reliability, agility, and supply chain visibility. Transportation expenses are one of the most important aspects of supply chain management, and efficiently managing these costs can boost total operational efficiency. Fuel, vehicle upkeep, tolls, and driver compensation all contribute to transportation costs. High transportation costs can put a strain on a company's budget and lower profit margins. As a result, businesses must discover ways to minimize expenses while maintaining service quality. Route optimization, shipment consolidation, and the use of technology, such as transportation management systems (TMS), are all ways for lowering transportation costs. Reduced transportation costs allow businesses to improve operational efficiency, offer more competitive rates to customers, and strengthen market competitiveness.

Delivery time is a critical aspect in deciding how quickly products reach end users. Fast delivery times are an important competitive advantage, especially in the e-commerce era, where buyers expect prompt and timely delivery. Reduced delivery times increase delivery reliability by guaranteeing that things reach on time. This is crucial for preserving client happiness and developing a positive market reputation. Furthermore, shorter delivery times improve supply chain agility. Companies that can provide items rapidly can better adapt to fluctuations in market demand, allowing for swift adjustments to changing demand and market trends. To achieve short delivery times, businesses must improve their logistics operations, which include choosing the fastest routes, utilizing real-time tracking technologies, and ensuring effective coordination among all supply chain stakeholders.

Transportation reliability refers to the consistency and predictability of transportation services. High reliability means that products always arrive on time. This is critical to maintaining consumer trust and happiness. High transportation reliability also lowers the risk of supply chain disruptions, such as stockouts or production delays caused by late deliveries of raw materials or components. To improve transportation reliability, organizations must spend in vehicle maintenance, driver training, and road and weather monitoring. Furthermore, real-time tracking technology can provide improved visibility into the status of shipments, allowing businesses to deliver precise information to customers about the arrival time of their products.

Fleet utilization describes how efficiently transportation vehicles are used. Optimal fleet utilization means that vehicles are fully utilized to move goods without losing time or capacity. This is vital for increasing operating efficiency and lowering transportation costs per unit of products. Poor fleet utilization can increase transportation expenses when vehicles are not used properly, resulting in needless fuel and maintenance costs. To achieve optimal fleet utilization, businesses must properly plan routes, consolidate shipments to maximize vehicle capacity, and use fleet management technology to monitor and optimize vehicle usage. Companies that optimize their fleet use can improve operational efficiency, cut costs, and increase supply chain agility. Overall, effective transportation management considerably improves operational efficiency. Reduced transportation costs allow businesses to expand profit margins and provide more competitive rates. High transportation dependability guarantees that things reach on time, which is essential for delivery reliability. Short delivery times enable businesses to adapt rapidly to changes in demand, hence improving supply chain agility. Optimal fleet utilization boosts operating efficiency and lowers costs, enabling agility and quick response to market changes.

Transportation dependability and efficiency have a significant impact on supply chain visibility. Companies that use real-time monitoring technology and transportation management systems may monitor the flow of goods in real time, delivering accurate and up-to-date information to all parties engaged in the supply chain. This improves openness and enables early detection of possible problems, such as late delivery or traffic disruptions, allowing remedial action to be performed swiftly. High visibility enables better planning, more informed decision-making, and more efficient collaboration across the supply chain. For example, in the automotive industry, good transportation management is important to ensuring that components arrive on schedule at the assembly line. Delays in component deliveries can cause production downtime, resulting in severe losses. As a result, automobile businesses engage in sophisticated transportation management systems to track and optimize component deliveries in real time. In this industry, transportation dependability and efficiency have a direct impact on production flow and the company's ability to meet car delivery timetables.

In the retail industry, particularly e-commerce, delivery speed and reliability are critical aspects in gaining consumer loyalty. Companies like Amazon have made significant investments in transportation and logistics technology to ensure prompt and dependable deliveries. To accelerate delivery, they deploy route optimization algorithms, driverless vehicles, and drones. Fast delivery times not only boost customer satisfaction, but also allow businesses to adapt rapidly to market movements, keeping inventory levels in line with customer demand.

Transportation prices, delivery times, transportation dependability, and fleet utilization all have a synergistic effect on and improve many areas of supply chain management. Companies that manage these aspects effectively can increase operational efficiency, delivery reliability, agility, and visibility in their supply chain operations. This gives businesses a substantial competitive advantage in a changing global environment, allowing them to better meet customer expectations, cut costs, and boost competitiveness. Thus, good transportation management is an essential component of a successful supply chain management strategy, allowing businesses to achieve long-term success.

The Impact of Warehouses on Supply Chain Management

Warehouses play an important role in supply chain management, influencing essential characteristics such as operating efficiency, delivery reliability, agility, and supply chain visibility. Four critical factors of warehouse management warehouse utilization rate, picking speed, error rate, and warehouse operating costs all influence the overall success or failure of the supply chain operation.

The warehouse utilization rate indicates how efficiently storage space is used. A high utilization rate implies that warehouse space is being used efficiently, thereby lowering the cost per unit of goods kept. Optimal warehouse usage enables businesses to store more goods without incurring further expenditure in new facilities. This increases operational efficiency by making the best use of existing assets and lowering storage expenses. However, a high utilization rate can cause congestion and make it harder to retrieve goods, slowing down selecting and shipping times. Effective warehouse management must strike a balance between optimal space utilization and simple access to stored goods. Picking speed relates to how quickly products are removed from storage and prepared for shipment. High picking speed is required to fulfill customer requests swiftly and on time. This has a direct impact on delivery reliability because orders may be processed and sent faster, resulting in shorter client wait times. High picking speeds can enhance operational efficiency by shortening the time required to process orders, allowing businesses to handle bigger order quantities without considerably growing their personnel. Furthermore, proper picking speeds promote supply chain agility by enabling businesses to respond swiftly to demand changes and changing market conditions.

The stock error rate compares the accuracy of inventory data to the actual physical stock in the warehouse. A low error rate suggests that inventory data is reliable, which is essential for supply chain visibility. High inventory accuracy guarantees that businesses have precise information about the amount of goods in stock, which is critical for production planning and stock replenishment. Low stock errors can improve delivery reliability since businesses can use inventory data to complete client orders on time. Conversely, excessive error rates can cause stockouts, delivery delays, and customer discontent. Thus, warehouse management should prioritize lowering the stock mistake rate with an effective inventory management system and tight control methods.

Warehouse running costs encompass all costs related to warehouse management and operation, such as labor, storage, and facility upkeep. Controlling warehouse operating costs is critical for increasing overall operational efficiency. Low expenses enable businesses to provide more competitive prices while increasing profit margins. However, operating expenses that are excessively low without regard for service quality can jeopardize dependability and speed of picking. As a result, operational cost management must be weighed against the need to manage stocks quickly and accurately. Warehouse running expenses can be reduced through a variety of methods, including process automation, increased worker efficiency, and the use of more advanced technologies. Overall, effective warehouse management improves operational efficiency by lowering storage and operating expenses. Optimal warehouse utilization rates, combined with fast picking speeds, improve delivery reliability, ensuring that orders are processed and sent on time. High inventory accuracy improves supply chain visibility by giving accurate real-time data for better decision-making. Furthermore, speed and flexibility in picking improve supply chain agility, allowing businesses to respond rapidly to changing demand and market conditions.

Large e-commerce companies, such as Amazon, rely largely on their warehouses' operational efficiency to fulfill client orders swiftly and accurately. They deploy automation technology including robotics and smart warehouse management systems to boost picking speeds and lower out-of-stock rates. By optimizing space use and reducing operational expenses, they are able to provide rapid and dependable delivery to consumers all over the world, increasing customer happiness and loyalty. Another example is the manufacturing business, which utilizes warehouses to store raw materials and components. Warehouse efficiency is crucial in this industry to ensure that production runs smoothly. Out-of-stock or late selection of raw materials can interrupt production and cause delays in delivering completed goods to clients. As a result, effective warehouse management is vital to ensuring production continuity and achieving delivery schedules.

In the retail industry, well-managed warehouses allow retailers to react rapidly to market developments and customer demand. With appropriate warehouse utilization rates and rapid picking speeds, businesses can ensure that popular products are always available, increasing consumer satisfaction and sales. Furthermore, good supply chain visibility enables businesses to check stock in real time and restock rapidly, reducing stockouts and missed sales. Thus, warehouse utilization rate, picking speed, stock-out rate, and warehouse operating expenses all have a synergistic effect on and improve numerous elements of supply chain management. Companies who can maximize these aspects will be able to improve supply chain efficiency, reliability, agility, and visibility, giving them a major competitive advantage in a fast-changing global market. Effective warehouse management is thus an essential component of a successful supply chain management strategy, allowing businesses to better satisfy customer demands and achieve long-term profitability.

The Impact of Distribution on Supply Chain Management

Distribution is an important part of supply chain management, encompassing factors such as distribution speed, customer service quality, distribution costs, and route efficiency. These four factors have a substantial impact on various critical areas of supply chain management, including operational efficiency, delivery reliability, agility, and supply chain visibility.

Distribution speed refers to how soon a product may be delivered from a warehouse or distribution center to the final customer. High distribution speed is essential in a competitive corporate climate where customers expect prompt and on-time delivery. Fast delivery boosts both customer happiness and business efficiency. Companies that shorten transit time can increase inventory turnover, save storage costs, and boost asset usage. Furthermore, fast distribution enables businesses to react rapidly to changes in market demand, which is crucial for preserving supply chain agility. Companies that can provide items rapidly can better respond to demand swings and capitalize on market possibilities.

Customer service level assesses the extent to which distribution meets customer expectations in terms of delivery speed, dependability and quality. A high service level ensures that consumers receive their products on time, in good shape, and with correct delivery status information. Good customer service helps to ensure delivery reliability since customers can rely on the company to keep its commitments. This dependability is critical for establishing client trust and loyalty, which can boost customer retention and long-term revenue. Furthermore, excellent service levels improve supply chain visibility by giving consumers with clear, real-time updates on the progress of their orders. By doing so, businesses may eliminate uncertainty and promote transparency in their distribution processes.

Distribution costs include all costs connected with getting products from the warehouse to the client, such as transportation, labor, fuel, and vehicle maintenance. Improving operational efficiency requires effective distribution cost management. Lower expenses enable businesses to provide more competitive prices while increasing profit margins. However, cost savings must be balanced against service quality. Cutting costs too much can jeopardize delivery reliability and customer happiness. As a result, businesses must strike a compromise between cutting expenses and providing high-quality service. Companies that manage their distribution costs well can increase operational efficiency without sacrificing service quality.

Route efficiency is the optimization of delivery routes to save travel time, fuel consumption, and operational expenses. Efficient routing guarantees that delivery take the quickest and most economical path. High route efficiency improves operational efficiency by lowering fuel costs and driver work hours. Route efficiency also increases delivery reliability by reducing the possibility of delays caused by congestion or greater travel distances. Companies can use technologies like transportation management systems (TMS) to plan and monitor routes in real time, improving supply chain visibility. Real-time data on cargo location and status enables businesses to make better decisions and respond more swiftly to possible difficulties.

These four characteristics of distribution are interconnected and have an impact on many aspects of supply chain management. Effective management of distribution costs, distribution speed, and route efficiency can lead to increased operational efficiency. Companies can boost profits and market competitiveness by lowering delivery costs and delays. Delivery reliability is improved through faster distribution and higher levels of customer service, ensuring that purchases arrive on schedule and in good condition. This dependability is critical for establishing client trust and retaining loyalty. Distribution speed and route efficiency improve supply chain agility, allowing businesses to respond swiftly to demand changes and alter operations to meet market needs. Finally, supply chain visibility is improved through the

use of technology and management systems that give real-time data on shipping and distribution statuses.

Overall, efficient and dependable distribution is an essential component of effective supply chain management. Businesses can improve their supply chains' operational efficiency, delivery reliability, agility, and visibility by optimizing distribution speed, customer service levels, distribution costs, and route efficiency. Companies who can effectively manage these components will gain a considerable competitive edge in meeting customer demand, lowering costs, and boosting competitiveness in an increasingly dynamic global environment.

Conceptual Framework

Based on the formulation of the problem, relevant previous research and the results and discussion of the research above, including:

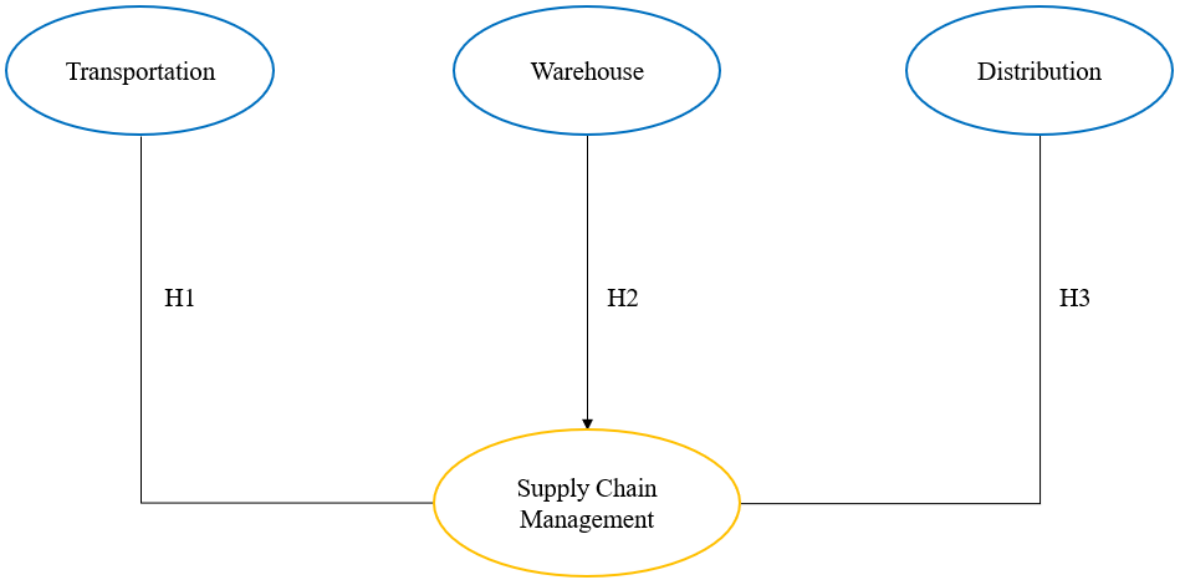


Figure 1. Conceptual Framework

Based on Figure 1 above, transportation, warehouse and distribution affect supply chain management. In addition to the independent variables (transportation, warehouse and distribution) above which affect the dependent variable (supply chain management), there are other variables that affect supply chain management, including:

1. Innovation: (Hermawan & Arifin, 2021), (Geraldine et al., 2023), (Afriyanti & Rahmidani, 2019).
2. Technology: (Simarmata & Keke, 2016), (Sawitri et al., 2023), (Ali et al., 2024), (Sudjoko, 2021).
3. Supplier: (Prabowo & Nasito, 2023), (Kumar et al., 2023), (Yun & Kurniawan, 2019), (Arif et al., 2017).

CONCLUSION

Based on the background of the problem, research objectives and discussion above, the conclusions obtained from this research include:

1. Transportation affects supply chain management.
2. Warehouses affect supply chain management.
3. Distribution affects supply chain management.

REFERENCES

Abdul, F. W., & Evitha, Y. (2019). Desain jaringan distribusi berbasis e-business pada sistem rantai pasok. *Jurnal Logistik Indonesia*, *3*(1), 39–51.

Afriyanti, T., & Rahmidani, R. (2019). Pengaruh Inovasi Produk, Kemasan, Dan Variasi Produk Terhadap Minat Beli Ice Cream Aice Di Kota Padang. *Jurnal Ecogen*, *2*(3), 270. https://doi.org/10.24036/jmpe.v2i3.7333

Alexander, D., & Pujawan, I. N. (2024). Perancangan Sistem Warehouse Berbasis Teknologi Ocr Untuk Meningkatkan Efektivitas Dan Efisiensi. *Jurnal Ilmiah Teknik Industri*, *12*(1), 1–11.

Ali, H., & Limakrisna, N. (2013). Metodologi Penelitian (Petunjuk Praktis Untuk Pemecahan Masalah Bisnis, Penyusunan Skripsi (Doctoral dissertation, Tesis, dan Disertasi. In *In Deeppublish: Yogyakarta*.

Ali, H., Susanto, P. C., & Saputra, F. (2024). Faktor-Faktor Yang Mempengaruhi Manajemen Transportasi Udara : Teknologi Informasi , Infrastruktur dan Kompetensi Sumber Daya Manusia. *Jurnal Siber Transportasi Dan Logistik (JSTL)*, *1*(4), 121–134. https://ejournal.stp-aviasi.ac.id/index.php/JIK/article/view/113

Ariani, D. W. (2023). Exploring Relationship of Job Satisfaction, Organizatonal Culture, and Employee Performance in Small Medium Enterprise. *International Journal of Professional Business Review*, *8*(2), 1–18. https://doi.org/10.26668/businessreview/2023.v8i2.876

Arif, M., Supriyadi, S., & Cahyadi (Universitas Serang Raya), D. (2017). Analisis Perencanaan Persediaan Batubara FX Dengan Metode Material Requirement Planning. *Jurnal Manajemen Industri Dan Logistik*, *1*(2), 148. https://doi.org/10.30988/jmil.v1i2.25

Chong, D., & Ali, H. (2021). Iot Relationship With Supply Chain , Work Effectiveness And Individual Behaviour. *Dinasti International Journal of Digital Business Management*, *3*(1), 170–179.

Geraldine, T., Peve, V., Lesly, F., Cochachin, U., C, K. T. P., Alberth, J., & Quispe, D. (2023). *Innovation And Organizational Culture In South American Companies In The Last Decade Article history : Keywords : Innovation ; Organizational Culture ; Innovation and Organizational Culture in South American Companies in the Last Decade The study of organ*. 1–14.

Hermawan, E., & Arifin, A. L. (2021). Human Resources Education and Innovation to face the demands of Business in the Digital Age. *Jurnal Iqra Kajian Ilmu Pendidikan*, *6*(2), 136–147.

Ilham, M. M., & Yofinaldi, S. (2024). Analisis Kinerja Sistem Warehouse Dalam Konteks Supply Chain Management. *Neraca: Jurnal Ekonomi, Manajemen Dan Akuntansi*, *2*(6), 14–30.

Jaya, R., Yusriana, Y., & Fitria, E. (2020). Review Manajemen Rantai Pasok Produk Pertanian Berkelanjutan: Konseptual, Isu Terkini, dan Penelitian Mendatang. *Jurnal Ilmu Pertanian Indonesia*, *26*(1), 78–91. https://doi.org/10.18343/jipi.26.1.78

Kartikasari, W., Setiawan, D., & Fauziah, E. (2021). Efektifitas Transportasi dan Lokasi Terhadap Distribusi Logistik di Wilayah Komando Armada I TNI-AL. *Rekayasa*, *14*(2), 183–190.

Kumar, P., Aziz, S., & Khan, A. M. (2023). The Influence Of Warehouse Management Systems On Supply Chain Efficiency : A Case Study Of The Online Garment Supplier ' S The Influence Of Warehouse Management Systems On Supply Chain Efficiency : A Case Study Of The Online Garment Supplier ' S Experience. *International Journal of Economics, Commerce and Management*, *11*(10), 159–168.

Mappesona, H., Ikhsani, K., & Ali, H. (2020). Customer purchase decision model, supply chain management and customer satisfaction: Product quality and promotion analysis.

International Journal of Supply Chain Management.

Martinetta, M. V. (2023). *Efektivitas Penggunaan Warehouse Management System (Wms) Pada Gudang Diamond Pt Ritra Cargo Semarang*. Universitas Diponegoro.

Nasruddin, Suryaningsih, & Nurwahidah. (2022). Peranan distribusi dalam meningkatkan penjualan pada pt . Safelock medical cabang bali , nusa tenggara. *Jak publik (Jurnal Administrasi Dan Kebijakan Publik)*, *3*(2), 62–68.

Nofrialdi, R., Saputra, E. B., & Saputra, F. (2023). Pengaruh Internet of Things: Analisis Efektivitas Kerja , Perilaku Individu dan Supply Chain. *Jurnal Manajemen Dan Pemasaran Digital (JMPD)*, *1*(1), 1–13.

Prabowo, I., & Nasito, M. (2023). Pengaruh Manajemen Rantai Pasokan Terhadap Kinerja Operasional pada SRC (Sampoerna Retail Community). *Jurnal Ilmiah Multidisiplin*, *1*(6), 541–553.

Prayetno, S., & Ali, H. (2020). Entrepreneurial supply chain management competence: Predictors of work motivation advocate. *International Journal of Supply Chain Management*, *9*(3), 444–454.

Prihantono, D. N. (2018). Komunikasi Bisnis Berorientasi Pelanggan di Perusahaan Distribusi. *Jurnal Audience: Jurnal Ilmu Komunikasi*, *1*(2), 123–143.

Rafli, M. (2022). Pengaruh tata letak, material handling equipment dan warehouse management system terhadap efektivitas pengelolaan gudang. *Jurnal Bisnis, Logistik Dan Supply Chain (BLOGCHAIN)*, *2*(2), 78–84.

Ricardianto, P., Wicaksana, D. A., Harahap, V. N., & Wardhana, A. (2021). Formulasi Strategi dalam Meningkatkan Seat Load Factor Penerbangan PT. Garuda Indonesia pada Rute Surabaya–Lombok. *Warta Ardhia*, *46*(2), 71–83.

Richardo, Muhammad Hussin, M. D., Norman, T. M. H. Bin, & Ali, H. (2020). Customer loyalty in supply chain management model: Promotion, products, and registration decision analysis. *International Journal of Supply Chain Management*, *9*(4), 911–923.

Sahara, S., & Saputra, Y. (2023). Pengaruh Transportasi Darat Terhadap Kelancaran Distribusi Logistik. *Innovative: Journal Of Social Science Research*, *3*(6), 8794–8800.

Sawitri, N. N., Susanto, P. C., & Suroso, S. (2023). Business Opportunity Human Resource Information System for a Human Resource Department to Create Career Path and Performance Evaluation. *East Asian Journal of Multidisciplinary Research (EAJMR)*, *2*(4), 1505–1516. https://doi.org/: https://doi.org/10.55927/eajmr.v2i4.3757

Senduk, H. Y., & Sitokdana, M. N. N. (2022). Perancangan Sistem Informasi Pencatatan Gudang Berbasis Website (Studi Kasus Slingbag Salatiga). *JATISI (Jurnal Teknik Informatika Dan Sistem Informasi)*, *9*(1), 373–383.

Simarmata, J., & Keke, Y. (2016). the Airline Customer ' S Buying Decision Through Online Travel Agent : a Case Study of the Passengers of Scheduled Domestic the Airline Customer ' S Buying Decision Through Online Travel Agent : a Case Study of the Passengers. *International Journal of Economics, Commerce and Management*, *IV*(3), 335–349.

Simarmata, J., Keke, Y., Veronica, Silalahi, S. A., & Benková, E. (2017). HOW TO Establish Customer Trust And Retention In A Highly Competitive Airline Business. *Polish Journal of Management Studies*, *16*(1), 202–214. https://doi.org/10.17512/pjms.2017.16.1.17

Simarmata, J., Sitorus, M. R., Yuliantini, & Arubusman, D. A. (2019). The factors influencing passengers' interest in using transportation services. *TEM Journal*, *8*(3), 945–950. https://doi.org/10.18421/TEM83-36

Soekirman, A. (2024). Meningkatkan Efisiensi Rantai Pasok melalui Penyedia Logistik, Transportasi Intermoda, Teknologi Informasi, dan Regulasi Pemerintah. *Ranah Research: Journal of Multidisciplinary Research and Development*, *6*(4), 476–483.

Sudjoko, C. (2021). Strategi Pemanfaatan Kendaraan Listrik Berkelanjutan Sebagai Solusi Untuk Mengurangi Emisi Karbon. *Jurnal Paradigma: Jurnal Multidispliner Mahasiswa Pascasarjana Indonesia*, *2*(2), 54–68.

Susanto, P. C., Arini, D. U., Marlita, D., & Yuntina, L. (2024). Mixed Methods Research Design Concepts : Quantitative , Qualitative , Exploratory Sequential , Exploratory Sequential , Embedded and Parallel Convergent. *International Journal of Advance Multidisciplinary*, *3*(3), 471–485. https://doi.org/https://doi.org/10.38035/ijam.v3i3

Susanto, P. C., Pahala, Y., Hartono, H., & Saroni, S. (2021). Proses Handling Barang Berbahaya Di Bandar Udara. *Aviasi : Jurnal Ilmiah Kedirgantaraan*, *17*(1), 45–53. https://doi.org/10.52186/aviasi.v17i1.58

Susanto, P. C., Ricardianto, P., Hartono, H., & Firdiiansyah, R. (2021). Peranan Air Traffic Control Untuk Keselamatan Penerbangan Di Indonesia. *Aviasi : Jurnal Ilmiah Kedirgantaraan*, *17*(1), 1–11. https://doi.org/10.52186/aviasi.v17i1.54

Susanto, P. C., Sawitri, N. N., Ali, H., & Rony, Z. T. (2024). Analysis of competency and job satisfaction on the performance of warehouse staff in logistics companies in jakarta. *International Conference on Humanity Education and Society (ICHES)*, *3*(1).

Susanto, P. C., Sawitri, N. N., & Suroso, S. (2023). Determinant Employee Performance and Job Satisfaction : Analysis Motivation , Path Career and Employee Engagement in Transportation and Logistics Industry. *International Journal of Business and Applied Economics (IJBAE)*, *2*(2), 257–268. https://doi.org/10.55927/ijbae.v2i2.2711

Susanto, P. C., Soehaditama, J. P., Soekirman, A., Suhendra, A., Valentin, A. D., & Sismiati, S. (2025). Konsep Penelitian Kualitatif : Tinjauan Pustaka , Studi Kasus , Pendekatan Etnografi , Informan , In-Depth Interview dan Focus Group Discussion. *Jurnal Inovasi Manajemen, Kewirausahaan, Bisnis Dan Digital*, *2*(2), 1–16. https://doi.org/https://doi.org/10.61132/jimakebidi.v2i2.485

Ulfah, R., Simarmata, J., Keke, Y., Amonalisa, S., & Amin, A. F. (2020). The influence of service quality and customer satisfaction through customer loyalty (study case lionair airline, indonesia). *Advances in Transportation and Logistics Research*, *3*, 828–835.

Wahono, S., & Ali, H. (2021). Peranan Data Warehouse, Software Dan Brainware Terhadap Pengambilan Keputusan (Literature Review Executive Support Sistem for Business). *Jurnal Ekonomi Manajemen Sistem Informasi*, *3*(2), 225–239. https://doi.org/10.31933/jemsi.v3i2.781

Yun, Y., & Kurniawan, A. (2019). Pengaruh Integrasi Rantai Pasokan Terhadap Keunggulan Bersaing Melalui Kinerja Rantai Pasokan pada Peternak Sapi Perah di Kabupaten Bandung Barat. *Jurnal Ilmu Manajemen Dan Bisnis*, *10*(1), 29–42. https://doi.org/10.17509/jimb.v10i1.15079