

## IMPROVING THE MANAGEMENT OF LOGISTICS PROCESSES

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### Abstract

Efficient logistics management has become a key factor in ensuring the performance and competitiveness of modern supply chains. With the increasing complexity of global trade and the growing use of digital technologies, organizations must continuously improve logistics processes such as transportation, procurement, inventory management, and order fulfilment. The aim of this study is to analyse methods for improving the management of logistics processes in modern supply chains. The research is based on a review of recent scientific literature and focuses on identifying key factors that influence logistics efficiency. The findings indicate that the integration of digital technologies, including real-time tracking systems, automated inventory platforms, and data-driven decision tools, significantly enhances coordination between logistics activities. Improved logistics process management leads to reduced operational costs, increased service quality, and better responsiveness to market changes. The study concludes that organizations that adopt integrated and technology-driven logistics systems are more likely to achieve sustainable competitive advantages in dynamic business environments.

**Keywords:** logistics management, supply chain management, transportation, procurement, inventory management, logistics optimization

### Introduction

Logistics management has become one of the most important components of modern business operations, as it ensures the efficient movement of goods, services, and information across supply chains. It plays a central role in connecting suppliers, manufacturers, and customers, enabling organizations to operate smoothly in increasingly competitive markets. Logistics processes include transportation, procurement, inventory management, warehousing, and order fulfilment, all of which must be effectively coordinated to achieve high operational performance and service quality (Ivanov et al., 2019; Islam et al., 2023). When these processes are properly managed, companies can reduce costs, improve delivery speed, and enhance customer satisfaction. The rapid growth of global trade and digital transformation has significantly increased the complexity of logistics systems. Companies now operate within interconnected global supply chains that involve multiple suppliers, distribution centres, and transportation networks across different regions. This level of complexity requires advanced planning, real-time coordination, and the ability to respond quickly to disruptions. As a result, organizations face increasing challenges in managing logistics processes efficiently while maintaining high service standards (Nguyen, 2025).

Inefficient logistics management can lead to higher transportation costs, delivery delays, inventory imbalances, and reduced customer satisfaction, which directly affect organizational performance. Therefore, companies are increasingly focusing on improving logistics process management to enhance efficiency and strengthen their competitive position in the market. Modern logistics systems rely heavily on digital technologies such as real-time tracking systems, data analytics, and automated inventory management platforms. These technologies allow organizations to monitor operations continuously, optimize resource utilization, and support faster and more accurate decision-making processes (Pan et al., 2025). As a result, the integration of advanced technologies into logistics management has become a key factor in achieving operational excellence and long-term business success.

**Research aim:** to analyse methods for improving the management of logistics processes in modern supply chains.

The following **objectives** have been set to achieve the aim:

1. To identify the importance of logistics management in supply chain performance.
2. To analyse key logistics processes including transportation, procurement, inventory management, and ordering.
3. To evaluate modern technologies and management approaches that improve logistics process efficiency.

### Research object and methods

The research object of this study is the management of logistics processes within modern supply chain systems, including transportation, procurement, inventory management, and order processing. The study is based on a qualitative research approach using the analysis of recent scientific literature and academic publications related to logistics management and supply chain optimization. Data were collected from academic databases such as Google Scholar, ScienceDirect, and other scientific sources. A comparative analysis method was applied to evaluate different logistics management practices and their impact on operational efficiency. The study aims to identify key strategies and technologies that support the improvement of logistics processes in modern business environments.

# Research results and discussion

## Key logistics processes and their role

Efficient management of logistics processes is a fundamental factor influencing the performance and competitiveness of modern supply chains. Core logistics activities, including transportation, procurement, inventory management, and order processing, must be effectively coordinated to ensure smooth material flow and high service quality. Among these, transportation management plays a critical role, as it directly affects delivery time, cost efficiency, and customer satisfaction. Research indicates that route optimization systems can reduce transportation costs by 15–30% (Ivanov et al., 2019, Pan et. al., 2025). While both studies confirm the cost-saving potential, Ivanov et al. focus on disruption resilience, whereas S. Pan at el. (2025) emphasizes real-time data integration. This suggests that cost reduction is not only dependent on optimization algorithms but also on the level of system integration and data availability. As a result, businesses with real-time tracking technologies and route optimization are more likely to improve efficiency. Studies show that effective procurement strategies can improve supply reliability by approximately 20%, especially when integrated with digital monitoring tools (Islam et al., 2023).

**Table 1.** Key Logistics Improvements and Performance Impact

| Process          | Methods                     | KPI                       | Improvement (%) |
|------------------|-----------------------------|---------------------------|-----------------|
| Transportation   | Route optimization, IoT     | Cost reduction            | 15–30%          |
| Procurement      | Digital procurement systems | Supply reliability        | ~20%            |
| Inventory        | AI-based inventory systems  | Cost reduction            | Up to 25%       |
| Order Management | Automated systems           | Processing time reduction | 20–40%          |
| Warehousing      | Automation (robotics)       | Productivity increase     | 20–40%          |

Source: Created by author based on Ivanov et al. (2019), Pan et al., (2025), Islam et al. (2023), Nguyen (2025)

Inventory management systems are essential for balancing supply and demand. Advanced inventory control technologies allow companies to monitor stock levels in real time and forecast demand more accurately. As a result, organizations can reduce excess inventory and avoid stockouts. According to recent studies, the implementation of digital inventory systems can reduce inventory holding costs by up to 25% while improving stock accuracy (Nguyen, 2025). Order management processes also play a key role in ensuring customer satisfaction. Digital order processing systems enable faster order handling, reduce processing errors, and improve communication with customers. Companies that adopt automated order management systems report significant improvements in service quality and order fulfilment speed.

## Role of digital technologies in logistics improvement

Digital technologies have become a key driver of efficiency and innovation in modern logistics systems, enabling organizations to optimize operations and respond more effectively to dynamic market conditions. One of the most significant advancements is the use of Internet of Things (IoT) technologies, which allow real-time tracking of goods, vehicles, and inventory throughout the supply chain. IoT sensors provide continuous data on location, temperature, and handling conditions, which is particularly important for sensitive goods such as food or pharmaceuticals. As a result, companies can improve visibility, reduce losses, and ensure higher product quality (Islam et al., 2023). Artificial intelligence (AI) and machine learning are also widely used to improve logistics decision-making processes. These technologies enable demand forecasting, route optimization, and predictive maintenance of transportation systems. For example, AI-based forecasting models can improve demand prediction accuracy by up to 20–30%, allowing companies to better plan inventory levels and reduce operational inefficiencies (Nguyen, 2025). In addition, data analytics platforms help organizations analyse large volumes of logistics data, identify inefficiencies, and optimize supply chain performance in real time.

Warehouse automation technologies represent another important aspect of digital transformation in logistics. Automated storage and retrieval systems (AS/RS), robotic picking systems, and automated sorting technologies significantly increase operational efficiency and reduce reliance on manual labour. Studies show that warehouse automation can improve productivity by approximately 20–40% while reducing operational errors and processing time (Ivanov et al., 2019). Furthermore, digital logistics platforms integrate different supply chain activities, including transportation, procurement, and inventory management, into a single system. This integration improves coordination, enhances transparency, and allows companies to respond more quickly to disruptions. Overall, the adoption of digital technologies in logistics not only improves operational efficiency but also supports the development of more flexible, data-driven, and resilient supply chains capable of adapting to rapidly changing business environments (Pan et. al., 2025).

## Challenges in logistics process management and improvement strategies

Despite the significant benefits of improving logistics processes and adopting digital technologies, organizations face several challenges that can limit operational efficiency. One of the main challenges is the lack of coordination between different logistics activities, such as transportation, procurement, and inventory management. When these processes are managed separately, it often leads to delays, increased operational costs, and inefficient resource utilization. Studies indicate that poor coordination within supply chains can increase logistics costs by up to 10–15%, particularly in complex global supply networks (Ivanov et al., 2019). Another major challenge is the high cost of implementing advanced technologies. While digital solutions such as artificial intelligence, IoT systems, and warehouse automation can significantly improve performance, their initial investment costs can be substantial. This is especially difficult for small and medium-sized enterprises, which may lack the financial resources to adopt such technologies. Although digital technologies offer significant benefits, their implementation is not uniformly successful across organizations. Nguyen (2025) notes that integration with legacy systems remains a major barrier, while Islam et al. (2023) emphasize workforce

skill gaps as a critical limitation. This suggests that technological advancement is insufficient on its own; organizational readiness and the growth of human capital also play a significant role. As a result, businesses need to strike a balance between technological investment, employee training, and process redesign.

To overcome these challenges, organizations should adopt a strategic and phased approach to logistics improvement. This includes gradually implementing new technologies, improving process integration, and strengthening collaboration between supply chain partners. Furthermore, the use of data-driven decision-making and continuous performance monitoring can help organizations identify inefficiencies and improve logistics operations over time. As a result, companies that effectively address these challenges can enhance supply chain resilience, reduce risks, and achieve sustainable competitive advantages in modern business environments (Pan et. al., 2025).

#### ***Performance measurement and continuous improvement in logistics processes***

An essential aspect of improving logistics process management is the ability to measure performance and implement continuous improvement strategies. Organizations must evaluate the effectiveness of logistics activities such as transportation, procurement, inventory management, and order processing using clearly defined performance indicators. Key performance indicators (KPIs) such as delivery time, order accuracy, inventory turnover, and logistics costs provide valuable insights into the efficiency of supply chain operations. Studies show that companies that actively monitor logistics performance can improve operational efficiency by up to 15–25%, as they are better able to identify inefficiencies and optimize processes (Nguyen, 2025).

One of the most widely used approaches in logistics improvement is the application of data-driven performance monitoring systems. These systems collect and analyse real-time data from different logistics activities, allowing organizations to make faster and more accurate decisions. For example, real-time tracking systems enable companies to monitor transportation performance and quickly respond to delays or disruptions. Similarly, inventory management systems provide data on stock levels and demand patterns, helping companies maintain optimal inventory levels and reduce storage costs (Islam et al., 2023). Continuous improvement methodologies, such as Lean logistics and process optimization techniques, are also widely applied to enhance logistics performance. These approaches focus on eliminating waste, reducing unnecessary activities, and improving process efficiency. Companies that implement continuous improvement strategies can achieve long-term benefits, including reduced operational costs, improved service quality, and increased customer satisfaction (Pan et. al., 2025).

Furthermore, performance measurement supports strategic decision-making in logistics management. By analysing performance data, organizations can identify areas that require improvement, evaluate the effectiveness of implemented solutions, and adapt their strategies to changing market conditions. As a result, performance measurement and continuous improvement play a crucial role in ensuring that logistics systems remain efficient, flexible, and competitive in modern supply chains.

## **Conclusions**

1. The study confirmed that the role of logistics management in supply chain performance is critical as it ensures the efficient movement of goods, information, and resources throughout the supply chain. Effective logistics coordination leads to a better delivery speed, fewer operational costs, customer satisfaction, and greater overall organizational competitiveness. Therefore, logistics management is an important factor that affects the efficiency of operations and the performance of the business in the modern supply chain.

2. The analysis of the key logistics processes revealed that transportation, procurement, inventory management and order processing are the core components of the logistics systems. Transportation management impacts delivery time and the cost efficiency, procurement ensures continuous availability of materials, inventory management ensures balance between supply and demand and order processing ensures customer satisfaction through accurate and timely order fulfilment. Proper coordination and integration of these logistics processes go a long way to improving supply chain efficiency and operational performance.

3. The evaluation of modern technologies and management approaches showed that digital technologies, such as Internet of Things (IoT), artificial intelligence (AI), data analytics, automated inventory systems and warehouse automation are highly efficient to improve the efficiency of logistics processes. These technologies improve real-time monitoring, demand forecasting, route optimization, and decision-making processes. In addition, the continuous improvement approaches such as performance measurement systems and Lean logistics help organizations to reduce waste, optimize operations, and improve service quality.

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