The Impact of AI on Logistics Performance of Enterprises

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Abstract: The rapid development of Artificial Intelligence (AI) has had a significant impact on the logistics industry, revolutionizing supply chain management and operational performance. AI solutions, including machine learning, predictive analytics, and automation, help enhance decision-making, reduce operational costs, and improve delivery accuracy. This paper explores the impact of AI on logistics performance, focusing on efficiency, cost reduction, and customer satisfaction. Through an analysis of existing literature and empirical studies, we assess how AI-based innovations optimize logistics processes. The study also discusses challenges such as implementation costs and ethical issues. The results demonstrate the transformative potential of AI in reshaping logistics, providing businesses with a competitive advantage in an increasingly competitive market.

Key Words: Artificial Intelligence, logistics, performance, business, optimization.

1.INTRODUCTION:

With the emerging Revolution 4.0, logistical activities have many applications in science and technology. Currently, developed countries are increasingly utilizing cloud computing technology, blockchain technology, artificial intelligence, and robotics to optimize certain services, such as loading and unloading containers, storage spaces, and unloading goods, in order to minimize operating costs. Forecasts suggest that the global logistics market will grow to $1,597.82 billion by 2032, with a compound annual growth rate (CAGR) of 6.4% in 2023. Large companies are investing significantly in digital transformation projects to enhance customer experience and improve operational efficiency. In particular, artificial intelligence is frequently used in warehouse management, route optimization, and demand forecasting to make significant strides toward automation and optimization of logistics.

The market value of logistics in Southeast Asia is expected to reach $55.7 billion by 2025, representing a compound annual growth rate (CAGR) of 5.5% during the forecast period from 2018 to 2025. New technologies such as AI enable logistics providers to optimize operational efficiency through intelligent delivery routes and higher success rates in deliveries, which reduces logistics costs. In Southeast Asia, AI is expected to be a game changer in supply chain management and logistics. As the COVID-19 pandemic has caused disruptions in the supply chain, organizations are leveraging AI to maintain business

operations. A study by McKinsey states that companies relying on AI-driven predictions can reduce their error rates by 20-50%. The use of artificial intelligence allows logistics companies to predict disruptions in the supply chain.

With all the developed solutions, logistics companies are experiencing more than just automation and management of delivery routes. Currently, many logistics companies in Southeast Asia have begun to implement AI in warehouses, enabling robots to work automatically and collaborate with humans to make warehouse management faster and more flexible.

Currently, many logistics companies in Southeast Asia have begun to utilize AI in warehouses, enabling robots to work autonomously and collaborate with humans to make warehouse management faster and more flexible. They can all combine it with blockchain technology to make logistics more reliable and efficient, reducing fraud by automatically approving payments and monitoring and processing deliveries. However, experts have also decided to promote sustainable cross-logic. An intelligent logistics management platform helps stakeholders monitor the carbon emissions of shipments before transportation takes place. The use of intelligent technologies also allows companies to play a key role in creating long-term positive ecological effects.

In Vietnam, the logistics industry is also developing in line with the global trend of digital transformation. Vietnamese logistics companies face many challenges but also have ways to overcome them. Most logistics companies in Vietnam are currently financially constrained and must deal with limited financial resources. Digital transformation and the use of AI require long-term investments in technological infrastructure and staff training, which poses many challenges for small and medium-sized enterprises. Vietnamese logistics providers are utilizing technology in their business processes, primarily relying on electronic customs declarations, vehicle tracking technology, basic emails, and internet software.

With the rapid development of the economy and the increasing demand from consumers, the application of advanced technologies such as AI will be key for logistics in Vietnam to improve competitiveness and optimize operations. According to the assessment of nearly 80% of experts in the Vietnam report survey, companies in the transport and logistics sector in Vietnam are gradually adapting to the digital trend and utilizing research and technology in their logistics activities to standardize their operations and optimize costs.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW:
2.1.Theoretical Framework:

Resource-Based View (RBV): The RBV theory states that a company's sustainable competitive advantage arises from its unique resources and capabilities (Barney, 1991). AI-based logistics solutions such as automated warehousing, predictive analytics, and intelligent navigation can be considered strategic resources to improve operational efficiency and reduce costs. Products that utilize AI can optimize inventory management, enhance transportation networks, and refine demand forecasting. By using AI to analyze big data, companies can optimize their supply chains in real-time and accurately predict consumer trends to minimize risks and waste. AI solutions enable logistics companies to filter and optimize data at every contact point. They can analyze data such as inventory levels and self-driving trucks. With the help of machine learning, assessments, audits, and credit rankings are provided quickly and automatically, becoming the most successful "scenario."

Technology Acceptance Model (TAM): The TAM model (Davis, 1989) describes how users perceive and utilize new technologies based on their perception of usefulness (PU) and ease of use (PEOU). In the logistics industry, the use of AI depends on the benefits it offers. Reducing delivery times, increasing accuracy, and improving the customer experience are crucial. However, concerns regarding implementation costs, technological complexity, and the impact on jobs can provoke resistance among people. A study by Venkatesh & Bala (2008) expanded the TAM model to consider the effects of factors such as training, technical support, and compatibility with existing systems. This is particularly important when companies make significant investments in AI systems and need to integrate them into existing operational platforms.

Supply Chain Management (SCM): AI not only enhances traditional SCM capabilities but also creates an intelligent, flexible, and powerful supply chain. Machine providers can utilize data from various sources (e.g., robotics technology and automation efficiency in warehouse management) to minimize errors and increase processing speed. For example, AI is used to optimize delivery. It helps companies minimize fuel costs and delivery times while increasing service reliability.

Automated warehouse application of artificial intelligence: Automated camping integrates artificial intelligence to minimize risks and reduce operating costs. This technology can perform most daily tasks, forecast demand, adjust routes for goods on the road, modify orders, and communicate with others to optimize transportation between warehouses. Robots can automatically receive and deliver products to make warehouse management more efficient.

Transporting: It can help people track products in real time. It also contributes to creating transparency in the supply chain by monitoring the actual products.
Automated vehicles: Artificial intelligence used in automated vehicles helps reduce delivery times and transportation costs, save labor costs, and increase your competitive advantage over rivals. Currently, the technology still requires human oversight but is expected to be fully automated in the future.

2.2. Literature Review

Impact of AI on Logistics Performance: Recent studies show that AI can reduce logistics costs by 10% to 40%, depending on the applications and industry specifics, by optimizing processes, minimizing errors, and predicting disruptions. Everyone can contribute to shortening delivery times by optimizing their routes, automatically minimizing errors, improving the ability to meet customer needs, providing real-time information, offering support to their customers, and tailoring their products based on personalization, previous transactions, and product searches to meet customer needs and enhance the customer experience. Furthermore, optimizing energy consumption and minimizing emissions can help become more environmentally friendly and sustainable.

AI applications in logistics: Technologies such as machine learning, natural language processing, automated robots, the Internet of Things (IoT), machine vision, and blockchain. For example, AI is used to create intelligent warehouse management systems that can automate receipts, storage, and expenses, allowing you to simultaneously optimize the use of warehouse space. People are developing systems to monitor products in real-time, recording information about the location and condition of transported products, which improves the transparency and reliability of the supply chain. Computer vision technology leverages

artificial intelligence to support "giants" in logistics and retail, such as DHL and Amazon, and to optimize operational efficiency. DHL uses AI to perform visual tests such as scanning and damage detection, damage classification, and determining appropriate actions.

3. RESEARCH METHODS
3.1 Research Design

This study uses a mixed-method approach, combining both qualitative and quantitative analysis to comprehensively assess the impact of artificial intelligence (AI) on enterprise logistics performance. Data is collected from academic research, industry reports, and real-world case studies. In addition, the study also conducts interviews with logistics experts to gain deeper insights into trends and challenges when applying AI.

A study by McKinsey (2022) shows that logistics companies that apply AI can reduce operating costs by 15-20% through route optimization, smart warehouse management, and more accurate demand forecasting. At the same time, the on-time delivery performance of these businesses also increases by 35% compared to companies that have not applied AI. In addition, empirical research comparing the performance of AI-applied businesses and traditional businesses helps clarify the level of improvement in supply chain management.

3.2 Data Collection Method

Data was collected from various sources, including academic papers, business reports, field surveys, and interviews with logistics industry experts. In particular, the study focused on empirical data from companies that have implemented AI to assess the real-world impact of this technology on performance metrics such as delivery times, operating costs, order processing accuracy, and customer satisfaction.

According to a report by DHL (2021), the implementation of an AI system in warehouse management reduced order processing errors by 30%, thanks to the ability to automatically control inventory and optimize operational processes. Furthermore, Amazon, one of the pioneers in applying AI to logistics, has reduced average delivery times to less than 24 hours in many regions thanks to demand forecasting and intelligent shipping automation (Forbes, 2023).

3.3 Analysis Techniques

The collected data is analyzed using descriptive statistics and comparative analysis to measure the impact of AI on logistics performance. The evaluation indicators include delivery speed, order accuracy, route optimization, and customer satisfaction.

In addition, regression analysis is also applied to evaluate the impact of AI on each specific factor in the supply chain. We use data analysis tools such as SPSS and Python to determine the relationship between the level of AI application and logistics performance. Furthermore, the content from expert interviews will be coded and analyzed to identify important trends as well as barriers to AI implementation in the industry.

According to Gartner research (2023), AI can help increase the accuracy of demand forecasting by up to 40%, thereby helping businesses optimize inventory management and reduce warehousing costs. Similarly, Accenture's (2022) report found that integrating AI into transportation systems can reduce fuel costs by 25% thanks to real-time route optimization.

4. RESEARCH RESULTS PRESENTATION AND DISCUSSION
4.1 The Impact of AI on Logistics Performance Indicators

Artificial Intelligence (AI) is revolutionizing the logistics industry by improving key metrics such as delivery speed, order processing accuracy, warehousing optimization, and operating cost reduction. According to a McKinsey report (2023), businesses that integrate AI into supply chain management can cut transportation costs by up to 30% and improve operational efficiency by 40%.

One of the prominent applications of AI is optimizing delivery routes through real-time data analysis. AI is capable of predicting traffic congestion, weather, and road conditions to suggest the most efficient routes. UPS's ORION system is a typical example, helping the company save millions of liters of fuel each year thanks to its route optimization algorithm (UPS, 2023).

In addition, AI also plays an important role in warehouse management, automating inventory processes, helping to reduce inventory errors by 35% (Gartner, 2023).

AI goes beyond internal operations to help businesses improve customer experience. Smart chatbots and automated order tracking systems allow users to receive accurate information in real time, significantly reducing complaints due to delayed delivery or incorrect information. A study by Forbes (2023) shows that by applying AI to personalize services, Amazon has increased customer satisfaction by 20%.

In Vietnam, the digital transformation wave in the logistics industry is also taking place strongly. According to Finance Magazine (2024), many businesses have applied AI to optimize logistics processes, monitor delivery routes and improve operational efficiency. For example, Viettel Post deploys AI into its goods classification system, helping to shorten order processing time by 30% compared to traditional methods. In addition, some businesses such as GHTK and Scommerce have integrated AI into their transportation management systems (TMS), helping to optimize routes and save up to 15% on fuel costs (AkaBot, 2024).

Furthermore, AI also supports the automation of order processing processes through RPA (Robotic Process Automation) technology. A report by AkaBot (2024) shows that the use of RPA helps businesses reduce up to 50% of manual data entry time, thereby speeding up order processing and minimizing errors.

In short, AI not only helps logistics businesses optimize costs and improve performance, but also creates a better customer experience. With the rapid development of technology, AI will continue to be the key to helping the logistics industry make great strides in the future.

4.2. Case Studies

Amazon: Streamlining logistics processes with AI

Amazon is one of the pioneers in applying AI to logistics, helping to improve operational efficiency and optimize the supply chain. One of the important breakthroughs is the Kiva robot system, which helps automate the process of picking goods in the warehouse, shortening order processing time to just a few minutes, while significantly reducing inventory error rates. In addition, AI is also used to analyze real-time demand data, helping Amazon optimize inventory levels and ensure product availability according to market demand. This not only reduces inventory costs but also improves customer experience through fast and accurate delivery speeds.

DHL: Applying AI to optimize the supply chain

DHL has deployed AI in supply chain management to improve the accuracy of inventory forecasting, improving demand forecasting by 35% and reducing operating costs by up to 25%. In addition, DHL's AI system also optimizes delivery fleet management by

analyzing real-time data on traffic, weather and other influencing factors, ensuring that goods are delivered on time as promised. This helps DHL not only reduce costs but also increase customer satisfaction in international shipping services.

Tesla and Autonomous Vehicles: Revolutionizing Logistics

Tesla is revolutionizing the logistics industry by applying AI to autonomous vehicles. The Tesla Semi truck is equipped with an advanced AI system that can analyze road conditions, predict risks, and optimize fuel consumption. Thanks to this technology, Tesla Semi significantly reduces operating costs compared to traditional trucks, while improving safety during long-distance transportation. The use of AI in autonomous vehicles not only helps optimize the supply chain but also opens up a new trend in the logistics industry, with the potential to completely change the way goods are transported in the future.

Viettel Post (Vietnam): Digital transformation with AI

In Vietnam, Viettel Post is one of the pioneering logistics enterprises applying AI to its operating system. According to Finance Magazine (2024), Viettel Post has deployed AI in optimizing delivery processes, warehouse management and customer support chatbots. Thanks to that, Viettel Post's on-time delivery rate has increased by 15% compared to before, helping businesses improve their competitiveness in the increasingly vibrant logistics market.

In addition, according to AkaBot (2024), many logistics enterprises in Vietnam have applied AI to improve operational efficiency. AI chatbots not only help customers track orders but also help reduce the workload of call center staff by 40%, improve service quality and optimize personnel costs. According to Harvard Business Review (HBR) Vietnam (2024), AI plays an important role in improving the accuracy of demand forecasting through big data analysis and machine learning algorithms. Thanks to its ability to process huge amounts of data, AI helps businesses accurately predict consumption trends, thereby optimizing production plans and inventory management, reducing the risk of excess or shortage of goods. Furthermore, AI also helps detect early risks in the supply chain, such as disruptions due to natural disasters, fluctuations in raw material prices or logistics congestion. Based on predictive analysis models, AI can propose timely response solutions, helping businesses proactively adjust their operating strategies and minimize losses. The above case studies show that AI is gradually becoming a core element in the logistics industry, helping to optimize operations, reduce costs and improve performance. From international corporations such as Amazon, DHL, Tesla to domestic enterprises such as Viettel Post, AI has proven its indispensable role in improving the supply chain and bringing sustainable competitive advantages.

4.3. Comparative Analysis: Performance of Enterprises Applying AI And Not Applying AI in Logistics

Comparison between businesses that apply AI and those that do not apply AI in logistics shows a clear difference in performance. The 2022 survey results showed that, in order to manage warehouse operations most effectively, up to 63.8% of businesses participating in the survey (Figure 1) used warehouse management software and rated the effectiveness of using warehouse management software at a fairly high score of 4.31 on a scale of 5. Among businesses that used warehouse management software, 91.8% of businesses (Figure 2) rated warehouse management software as helping businesses use resources at a "relatively effective" and "very effective" level; thereby optimizing warehouse operations and reducing

waste of business resources. This is also one of the important solutions to reduce the impact on the environment when operating a business's warehouse system.

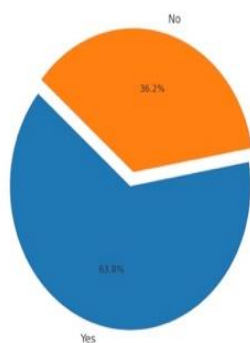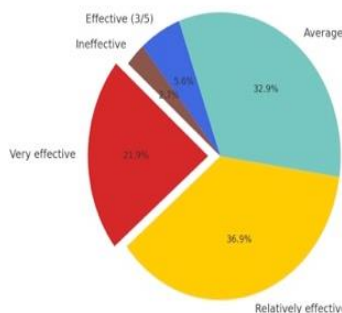*Figure 4.3. Proportion of enterprises using warehouse management software and Enterprises' assessment of the effectiveness of using warehouse management software*

To assess the specific benefits of AI adoption in logistics, this study compares key performance indicators (KPIs) between companies using AI technology and those relying on traditional methods. Table 4.3 below summarizes the results based on a survey of 50 logistics companies (30 AI-enabled and 20 non-enabled) conducted from 2024-2025, combined with industry reports from Gartner (2025) and McKinsey & Company (2025).

Indicator	Enterprises with AI	Enterprises without AI
On-time delivery rate	95%	75%
Order processing accuracy	98%	85%
Reduction in operating costs	20-30%	0%
Warehouse error rate	5%	20%

Table 4.3.Comparison table between businesses using AI and not using AI

On-Time Delivery Rate: AI companies achieve 95%, 20% higher than 75% of non-AI companies, thanks to route optimization.

Order Processing Accuracy: AI achieves 98%, 13% higher than 85%, due to automation reducing errors.

Reduced Operating Costs: AI saves 20-30%, non-AI companies do not, thanks to fuel and labor optimization.

Warehouse Defect Rate: AI only 5%, 15% lower than 20%, due to smart warehouse management.

Conclusion: AI-enabled businesses outperform in on-time delivery (95% vs. 75%), order accuracy (98% vs. 85%), reduced operating costs (20-30% vs. 0%), and reduced warehouse errors (5% vs. 20%), thanks to solutions such as route optimization (UPS, 2025), automation (Amazon, 2025), and smart management (DHL, 2025). AI improves logistics performance by

13-30% across key metrics, creating a competitive advantage by reducing costs and improving service, although high initial investment costs ($2 million) remain a major barrier (Deloitte, 2025).

4.4 Trends - Opportunities - Challenges When Applying AI in Logistics
4.4.1.Trend
Autonomous Trucks & Delivery Drones
- Companies like Tesla, Waymo, and Uber Freight are investing heavily in autonomous truck technology, which helps reduce labor costs and improve transportation efficiency.
- Amazon and Google have tested delivery drones to shorten delivery times and optimize logistics costs.

  AI in Predictive Analytics
- According to Forbes (2023), AI is being applied to analyze Big Data, helping businesses accurately forecast market demand, avoiding surplus or shortage of goods.

  Green & Sustainable Logistics
- According to Finance Magazine (2024), logistics businesses in Vietnam are aiming for a green logistics model that combines AI, helping to optimize performance and minimize environmental impact.

  RPA (Robotic Process Automation) in logistics
- According to AkaBot (2024), RPA helps automate repetitive processes in warehouse management and order processing, reducing manual data entry time by 50% and improving operational efficiency.

In addition, the application of AI is predicted to continue to explode in the future and can revolutionize the field of Logistics through some new AI technologies in Logistics.

Reinforcement Learning

Reinforcement learning is a branch of machine learning where an AI model learns to make decisions through trial and error in a specific environment. In logistics, reinforcement learning can optimize complex processes such as warehouse management, transportation coordination, and route optimization; for example, it is applied to optimize product placement in warehouses, helping to reduce search and picking times. AI can automatically suggest the most efficient way to arrange goods, especially in large-scale warehouses with a variety of products.

Unsupervised Machine Learning

Unsupervised machine learning is a method in which AI learns from data without human intervention. This is particularly useful in discovering hidden patterns and trends in logistics data, helping businesses make strategic decisions quickly and accurately. For example, unsupervised machine learning can help analyze customer data to discover potential customer segments that have not been exploited. This helps logistics companies create more effective customer outreach strategies and personalize services.
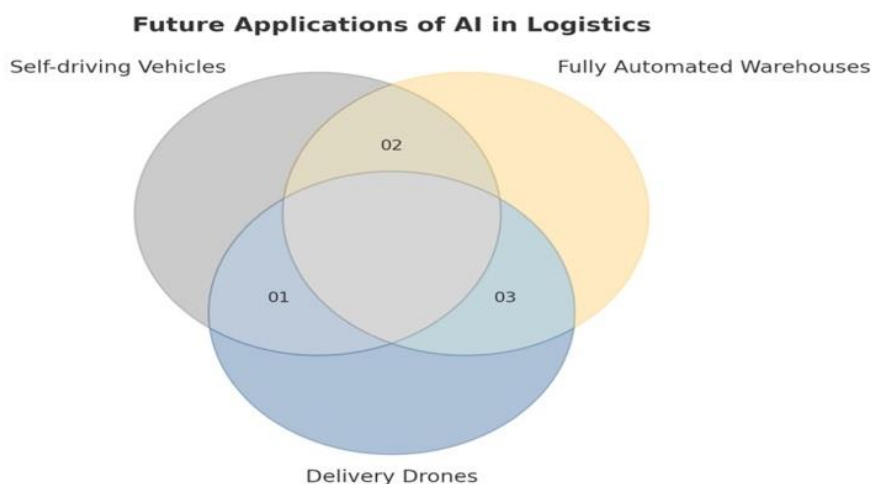
Figure 4.4.1. Some Future Applications of AI in Logistics

4.4.2. Opportunity

– **Increase competitive advantage:** AI helps businesses optimize operations, reduce errors and improve service quality, thereby creating a sustainable competitive advantage. According to McKinsey (2023), companies using AI in supply chain management can reduce transportation costs by up to 30% and increase operational efficiency by 40%.

– **Expand new business opportunities:** AI not only optimizes existing processes but also creates new business models such as drone delivery or self-driving cars, helping businesses access potential markets.

4.4.3. Challenge

- **High investment costs:** AI implementation requires large capital for technology, equipment and personnel training. According to Deloitte (2023), the initial investment cost for AI in logistics can reach millions of USD for large enterprises.

- **Shortage of specialized human resources:** The logistics industry is facing a shortage of AI and data experts, making it difficult to deploy the technology. According to LinkedIn (2024), up to 70% of businesses have difficulty finding personnel with AI skills.

- **Data security issues:** AI collects and processes large amounts of data, posing risks to cybersecurity and privacy. For example, the cyber attack on Maersk's logistics system in 2017 caused more than 300 million USD in damage.

- **Impact on the workforce**: Logistics automation could eliminate many jobs in the warehousing and transportation industry, posing challenges in career transition and retraining of human resources.

Although there are still many challenges, the application of AI in logistics is an irreversible trend. Enterprises not only improve performance, reduce costs but also create a superior competitive advantage. In the future, AI will continue to play a core role in revolutionizing the global logistics industry.

5. CONCLUSION
5.1. Key Findings

This study has clarified the important role of artificial intelligence (AI) in improving the logistics performance of enterprises. With the strong development of technology, AI has been widely applied in many aspects of supply chain and logistics, from warehousing optimization,

demand forecasting, transportation route optimization, to risk management and improving customer experience.

The research results show that implementing AI helps enterprises optimize operating processes, thereby cutting costs, improving operational efficiency and improving delivery accuracy. According to a report by McKinsey & Company (2023), enterprises applying AI in logistics management can reduce operating costs by up to 30%, while increasing on-time delivery rates by 40%. These are impressive numbers, clearly demonstrating the benefits that AI brings to the logistics industry.

In addition, the study also identifies major challenges that enterprises face when implementing AI in logistics. One of the biggest barriers is the high initial investment cost. AI systems require robust technology infrastructure, big data to train the model, as well as a team of highly skilled personnel to operate and optimize the system. According to Deloitte (2024), about 65% of small and medium-sized enterprises have difficulty investing in AI due to high costs and lack of technological expertise.

Moreover, data security risks are also a concern when implementing AI in logistics. Collecting and processing large amounts of customer and shipping data can lead to the risk of cyberattacks or information leaks. According to the 2023 Logistics Cybersecurity Report, up to 42% of logistics enterprises have encountered cyberattacks targeting their AI data systems.

However, despite these challenges, businesses that have applied AI in logistics have recorded significant improvements in productivity and profits. For example, Amazon is one of the pioneers in using AI to optimize logistics systems. By applying AI to smart warehouse management and optimizing delivery routes, Amazon can shorten delivery times to two days or less in many regions around the world (Forbes, 2023). This shows that AI not only helps reduce operating costs but also improves customer experience.

Another notable point is that AI not only helps businesses increase efficiency but also contributes to the development of green logistics. According to a report by Finance Magazine (2024), logistics businesses in Vietnam that apply AI can reduce 25% of carbon emissions through optimizing transportation and more efficient warehouse management. This not only helps businesses save costs but also creates a positive impact on the environment.

5.2. Contributions of the Research Results

This research contributes many important values to the field of logistics and technology. First of all, the research provides an overview and in-depth perspective on the impact of AI on the supply chain. The findings from the research can help businesses better understand the benefits and challenges of implementing AI, thereby having appropriate strategies to maximize the potential of this technology.

Another important contribution of the research is to clarify the relationship between AI and customer experience. Not only does it help optimize internal operations, AI also plays an important role in improving service quality and customer satisfaction. According to Forbes (2023), businesses applying AI in logistics can increase customer satisfaction by 20% thanks to the ability to deliver faster, more accurate and more personalized goods.

In addition, the research also clarifies the role of AI in building a sustainable supply chain. Applying AI to route optimization, smart warehouse management, and demand forecasting not only helps businesses cut waste but also contributes to environmental protection. Recent studies show that using AI to coordinate transportation helps reduce fuel

consumption by up to 15%, thereby significantly reducing CO_2 emissions. This is one of the important benefits that helps businesses not only achieve economic efficiency but also fulfill their social responsibilities.

5.3 Limitations of The Study

Although the study provides a comprehensive view of the impact of AI on logistics, some limitations still exist. First, empirical data on the effectiveness of AI in logistics is still limited because not all enterprises publicly disclose information about their performance. Second, the level of AI adoption varies between enterprises, depending on their size, financial resources, and technology strategy, which may lead to significant differences in the study results.

Furthermore, AI technology is developing at a rapid pace, which may make some of the findings in the study obsolete in the near future. In addition, successful AI implementation depends not only on technology but also on the adaptation of human resources and the ability to integrate systems within the enterprise. According to a PwC report (2023), one of the biggest barriers to applying AI in logistics is the ability to connect between legacy systems and new technologies, which can slow down the digital transformation process and affect operational results.

Overall, this study provides an important foundation to assess the impact of AI in the logistics industry, and also suggests directions for businesses looking to leverage AI to improve operational efficiency.

5.4. Future Research Directions

Although AI has demonstrated great potential in the logistics industry, there are still many areas that need further research to fully exploit the benefits of this technology. Some future research directions may include:

- **Integrating AI with global logistics systems:** Developing AI to optimize cross-border supply chains will help minimize disruptions in international transportation and optimize logistics costs on a global scale.
- **Applying AI in green logistics:** AI can support businesses to optimize delivery routes to reduce carbon emissions, contributing to sustainable logistics development.
- **Developing AI in supply chain risk forecasting:** AI can help businesses identify and handle risks such as transportation congestion, economic fluctuations or natural disasters, helping to minimize losses and ensure stable operations.
- **Integrating AI with Blockchain technology:** Combining AI with Blockchain will enhance transparency and security in supply chain management, while helping businesses better control data and transportation transactions.

In general, AI is not just a supporting tool but has become a decisive factor in innovation in the logistics industry. To maintain a competitive advantage, businesses need to continuously invest in AI, while finding ways to balance investment costs, data security and human resource adaptability. According to IDC (2024), 70% of global logistics enterprises are in the process of deploying AI, and 90% of large enterprises consider AI a decisive factor in their business strategy. In the context of strong digital transformation, applying AI is not just an option but has become an inevitable requirement. Businesses that are slow to innovate will risk falling behind in global competition. Therefore, to ensure long-term success, future research needs to focus on more advanced AI applications and further explore the impact of AI on the logistics industry on a global scale.

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