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Research on Automation and Efficiency Optimization in Intelligent Logistics Centers — Taking JD Logistics' "Asia No.1" as an Example

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Abstract

This study investigates how automation technology in intelligent logistics centers can significantly enhance logistics efficiency, taking JD Logistics' "Asia No.1" smart logistics center as a case example. By analyzing the implementation methods of highly automated operations and their impact on operational efficiency, the research finds that large-scale application of artificial intelligence, big data, cloud computing, and robotics can build a comprehensive intelligent logistics system. This system achieves full-process intelligence and unmanned operations in logistics, greatly improving operational efficiency. In addition, the study explores the application effects of automation technology in different logistics links and provides insights for the design and management of future logistics centers.

Keywords: intelligent logistics, automation technology, efficiency optimization, JD Logistics, "Asia No.1", artificial intelligence, big data, Internet of Things, robotics, logistics center design, automated warehousing, path planning, inventory management, unmanned operations, logistics innovation, operation management

1. Introduction

1.1 Research Background

With the acceleration of global economic integration and the rapid development of e-commerce, the logistics industry, as a key link connecting production and consumption, is facing unprecedented opportunities and challenges. In recent years, the logistics industry has gradually shifted from a labor-intensive model to a technology-intensive model, and intelligent logistics has emerged accordingly. Intelligent logistics integrates cutting-edge technologies such as artificial intelligence, big data, and the Internet of Things to achieve full-process automation, intelligence, and unmanned operations in logistics, greatly improving logistics efficiency and service quality.

1.2 Development Trends of the Logistics Industry and the Rise of Intelligent Logistics

The traditional operation mode of the logistics industry faces many bottlenecks, such as high labor costs, low efficiency, and unstable service quality. With the continuous progress of technology, intelligent logistics has become the key to solving these problems. Intelligent

logistics can not only achieve rapid sorting and precise delivery of goods but also optimize the layout of logistics networks through data analysis, reducing operating costs. JD Logistics, as a leading domestic logistics enterprise, has been committed to promoting the intelligent transformation of the logistics industry through technological innovation.

1.3 Background of JD Logistics' "Asia No.1" as an Industry Benchmark

JD Logistics' "Asia No.1" smart logistics center is an important achievement of JD Logistics in the field of intelligent logistics. Since the first "Asia No.1" was put into use in 2014, this series of logistics centers has been laid out in many places across the country and has become a benchmark for intelligent logistics in the industry. By widely applying automated equipment and intelligent management systems, "Asia No.1" has achieved automation and intelligence in warehousing, sorting, and delivery, significantly improving operational efficiency and service quality. (Ibiyemi, M. O., & Olanrewaju, D. O., 2024)

1.4 Research Significance

This study aims to explore how automation technology in JD Logistics' "Asia No.1" smart logistics center can significantly enhance logistics efficiency by conducting an in-depth analysis of the center. The research not only supplements and improves the theoretical system of automation technology application in the logistics industry but also provides practical guidance for the design and management of corporate logistics centers. By summarizing the successful experience of "Asia No.1," other logistics enterprises or related industries can draw lessons and promote the widespread application of intelligent logistics.

1.5 Research Objectives and Questions

The main objectives of this study include:

- Exploring how "Asia No.1" enhances logistics efficiency through automation technology;
- Analyzing the application effects of automation technology in different logistics links (such as warehousing, sorting, and delivery);
- Providing insights for the design and management of future logistics centers.

2. Literature Review

Intelligent logistics integrates artificial intelligence, big data, the Internet of Things, and other technologies to achieve full-process automation and intelligence in logistics. It optimizes logistics network layouts and improves warehousing and delivery efficiency. The development of intelligent logistics has evolved from mechanization to automation and then to intelligence. In the early days, it relied on manual labor and simple equipment, but now, with the help of the Internet of Things and big data, intelligent logistics has become mainstream. Logistics centers widely use automated equipment (such as AGVs and robots) and intelligent management systems to achieve rapid storage and sorting of goods. However, challenges such as high equipment costs and complex system integration still exist. Automated and intelligent warehouse management systems have improved space utilization and inventory management efficiency, while automated sorting systems have increased sorting speed and accuracy. JD Logistics' "Asia No.1" has become a benchmark for intelligent logistics by achieving efficient operations through automated equipment and intelligent management systems. Its technological applications and management models have attracted widespread attention. However, existing research lacks sufficient analysis of the application effects of automation technology in different logistics links and does not provide a systematic insight into the design and management of future logistics centers.

3. Research Methods

3.1 Case Study Method

This study adopts the case study method, taking JD Logistics' "Asia No.1" as the core case to deeply analyze the automation technology in intelligent logistics centers and its role in optimizing efficiency. The reason for choosing "Asia No.1" is that it represents the highest level of intelligent logistics in the industry. Its technological advancement and data availability provide rich materials and empirical foundations for the research. By collecting data through field research, interviews, and corporate reports, we can comprehensively obtain first-hand information to deeply understand the application logic and effects of automation technology in actual operations. (Ibiyemi, M. O., & Olanrewaju, D. O., 2024)

3.2 Qualitative Analysis

Qualitative analysis focuses on the implementation methods and operating mechanisms of automation technology. By providing detailed descriptions of automated equipment in "Asia No.1" (such as automated three-dimensional warehouses, sorting systems, and robotic technology), we reveal their technological advantages and application scenarios. At the same time, combined with interviews and field research, we deeply analyze how key technologies such as artificial intelligence, big data, and the Internet of Things are integrated into various operational links of the logistics center to achieve intelligent management. In addition, qualitative analysis will also explore the challenges encountered in the application of automation technology and their solutions, providing references for other enterprises.

4. Introduction to JD Logistics' "Asia No.1" Intelligent Logistics Center

4.1 Corporate Background and Project Overview

JD Logistics, as a leading supply chain solution and logistics service provider in China, has positioned its "Asia No.1" project as the core of its intelligent strategy. By establishing highly automated logistics centers, it addresses the efficiency bottlenecks and cost issues of traditional logistics, achieving full-process automation and intelligence and significantly improving operational efficiency and service quality. The project is not only a reflection of its technological strength but also a crucial support for its strategic transformation.

4.2 Key Facilities and Technologies of the Intelligent Logistics Center

The core competitiveness of "Asia No.1" lies in its advanced facilities and the in-depth application of key technologies. The automated three-dimensional warehouse system, through high-rise shelves and automated equipment, greatly improves the space utilization and in-out efficiency of the warehouse. The automated sorting system (such as cross-belt sorters) achieves precise sorting and rapid delivery of goods, significantly improving sorting efficiency and accuracy. The application of handling robots and unmanned forklifts reduces manual operations and improves the safety and efficiency of logistics operations. The intelligent warehousing management system (WMS), as the "brain" of the logistics center, realizes real-time monitoring and inventory management of goods through the Internet of Things, optimizes inventory layout, and improves the accuracy and efficiency of inventory management. (Qi, Q., Jiang, Y., & Wang, D., 2020)

4.3 In-Depth Application and Synergistic Effects of Key Technologies

The success of "Asia No.1" lies in the in-depth application and synergistic effects of key technologies such as artificial intelligence, big data, the Internet of Things, and cloud computing. Artificial intelligence technology optimizes the storage location and delivery path of goods through intelligent scheduling and path planning, improving equipment utilization and delivery efficiency. Big data technology analyzes historical sales data and market trends to achieve precise demand forecasting and inventory management, reducing inventory costs. The Internet of Things technology realizes interconnectivity among all equipment in the logistics center, and through sensors and network technology, it monitors the operating status of equipment in real-time, improving equipment reliability and operating efficiency. Cloud computing technology provides powerful data processing and system support capabilities for the logistics center, ensuring the efficient operation of intelligent logistics operations. The synergistic effects of these technologies not only enhance the automation level of the logistics center but also achieve intelligent and unmanned logistics operations, providing important references for the future development of the logistics industry.

5. Application and Implementation of Automation Technology in "Asia No.1"

Asia No.1, as the core project of JD Logistics' intelligent logistics system, has achieved full-process intelligence and unmanned logistics operations through a series of cutting-edge automation technologies. These technologies have not only improved logistics efficiency but also significantly reduced operating costs, providing important references for the future development of the logistics industry.

5.1 Automated Warehousing Management

Warehousing management is one of the core links in the logistics center, and Asia No.1 has achieved efficient and intelligent warehousing operations through highly automated shelving systems, robotic technology, and intelligent inventory management.

5.1.1 Automated Shelving and Storage Systems

The Automated three-dimensional Warehouse System (AS/RS) adopted by Asia No.1 is the core of its warehousing management. Through high-rise shelves and high-speed stacker cranes, the system greatly increases the space utilization and storage density of the warehouse. The automated three-dimensional warehouse system of this warehouse can store more than 1 million items, while a traditional warehouse can only store about 300,000 items in the same area. This highly efficient storage system not only saves land resources but also significantly improves the operational efficiency of the warehouse. Compared with traditional warehouses, the storage capacity of automated three-dimensional warehouses has increased nearly threefold, with shelf heights reaching up to 24 meters. The high-speed stacker cranes equipped can complete goods storage and retrieval operations in a short time, significantly improving in-out efficiency. (Qi, Q., Jiang, Y., & Wang, D., 2020)

Table 1.

Item	**Traditional Warehouse**	**Automated three-dimensional Warehouse**
Storage Density	1.2 tons/m²	3.5 tons/m²
In-out Efficiency	30 times/hour	120 times/hour
10 Labor Demand	11 50 people/10,000 m²	12 people/10,000 m²

- **Technical Details:** The automated three-dimensional warehouse system achieves precise positioning through laser navigation and vision recognition technology. Its operating speed can reach 2 meters/second, and it can quickly respond to order demands. In addition, the system is equipped with an intelligent scheduling algorithm that can optimize paths based on order priority and goods location, further improving operational efficiency.

5.1.2 Application of Robots in Goods Storage and Retrieval

Asia No.1 widely deploys robotic technology for goods storage and retrieval. Among them, the Goods-to-Person (GTP) system is an important part. These robots can automatically navigate to the designated shelves according to system instructions, transport goods to the operators, and reduce the time spent by manual workers walking and searching for goods. In the Asia No.1 Zengcheng Warehouse in Guangzhou, the introduction of the robotic system has increased warehousing operation efficiency by 60%, while reducing labor demand by 60%. This highly efficient warehousing operation method not only improves logistics efficiency but also reduces operating costs. (Ibiyemi, M. O., & Olanrewaju, D. O., 2024)

Table 2.

Item	**Manual Operation**	**Robotic Operation**
Operation Efficiency	100 items/hour	160 items/hour
Labor Demand	100%	40%

- **Technical Details:** The GTP robots achieve precise positioning through laser navigation and vision recognition technology. Their operating speed can reach 2 meters/second, and they can quickly respond to order demands. In addition, the robotic system is equipped with an intelligent scheduling algorithm that can optimize paths based on order priority and goods location, further improving operational efficiency.

5.2 Automated Sorting and Delivery

The sorting and delivery links are the keys to improving logistics efficiency. Asia No.1 has achieved efficient and intelligent sorting and delivery through advanced automated sorting equipment, intelligent delivery path planning, and the application of unmanned delivery vehicles.

5.2.1 Operating Mechanism of Automated Sorting Equipment

Asia No.1 is equipped with advanced automated sorting equipment such as cross-belt

sorters. These devices can automatically recognize goods based on order information and sort them into designated delivery areas. In the Asia No.1 Longgang Warehouse in Shenzhen, the application of cross-belt sorters has increased sorting efficiency by 30 times. The sorting speed of cross-belt sorters can reach 10,000 items per hour, with a sorting accuracy rate as high as 99.99%. Through these highly efficient sorting devices, JD Logistics can quickly process a large number of orders and meet the logistics demands during the e-commerce peak season. (Goyal, S. K., & Sharma, A., 2016)

Table 3.

Item	Manual Sorting	Automated Sorting
Sorting Speed	300 items/hour	10,000 items/hour
Sorting Accuracy	95%	99.99%

- **Technical Details:** Cross-belt sorters achieve rapid sorting of goods through high-speed conveyor belts and intelligent recognition systems. The core is based on machine vision and barcode recognition technology, which can accurately identify goods information and automatically adjust sorting paths. In addition, the system is equipped with fault detection and early warning mechanisms to ensure the efficient operation of the equipment.

5.2.2 Intelligent Delivery Path Planning and Optimization

Asia No.1 uses artificial intelligence and big data technology to achieve intelligent delivery path planning. The system can dynamically optimize delivery routes based on real-time traffic conditions, order density, and delivery time windows. In the Asia No.1 Longquan Warehouse in Chengdu, the intelligent path planning system optimizes delivery routes by analyzing historical order data and real-time traffic information, reducing the average mileage of delivery vehicles by 30% and increasing delivery efficiency by 25%. This optimization not only reduces operating costs but also reduces carbon emissions, in line with the development trend of green logistics. (Goyal, S. K., & Sharma, A., 2016)

- **Technical Details:** The intelligent path planning system dynamically adjusts delivery routes by analyzing historical order data and real-time traffic information through machine learning algorithms. Its core advantage lies in the ability to optimize paths based on real-time road conditions and reduce delivery time.

5.3 Automated Packaging and Loading/Unloading

Asia No.1 has also achieved high levels of automation in the packaging and loading/unloading links, significantly improving the efficiency and quality of logistics operations through advanced automated packaging equipment and automatic loading/unloading systems.

5.3.1 Automated Packaging Equipment and Technology

Asia No.1 uses automated packaging equipment that can automatically adjust the use of packaging materials based on the size and weight of goods. These devices not only improve packaging efficiency but also reduce the waste of packaging materials. In the Asia No.1 Jiangning Warehouse in Nanjing, the application of automated packaging equipment has increased packaging efficiency by 50% and reduced packaging material usage by 20%. This highly efficient packaging method not only improves logistics efficiency but also reduces packaging costs.

Table 4.

Item	Manual Packaging	Automated Packaging
Packaging Efficiency	40 items/hour	60 items/hour
Packaging Material Usage	100%	80%

- **Technical Details**: Automated packaging equipment achieves goods packaging through sensors and robotic arms. Its core is based on machine vision technology, which can accurately identify the size and shape of goods to optimize the use of packaging materials. In addition, the equipment is equipped with an intelligent control system that can adjust the packaging process based on order information.

5.3.2 Design and Implementation of Automatic Loading/Unloading Systems

Asia No.1 is equipped with automatic loading/unloading systems that can achieve rapid loading and unloading of goods. These systems, through the coordinated work of robotic arms and conveyor belts, reduce manual operations and improve loading/unloading efficiency. In the Asia No.1 Hongshan Warehouse in Wuhan, the automatic loading/unloading system, through the coordinated work of robotic arms and conveyor belts, achieves rapid loading and unloading of goods. The system can complete the loading/unloading of a truck in just 10 minutes, significantly improving logistics efficiency.

- **Technical Details:** The automatic loading/unloading system achieves rapid loading and unloading of goods through the coordinated work of robotic arms and conveyor belts. Its core is based on sensors and automated control systems, which can accurately identify the position and status of goods to optimize the loading/unloading process.

5.4 Summary

Through automated warehousing management, automated sorting and delivery, and automated packaging and loading/unloading, **Asia No.1** has achieved full-process automation and intelligence in logistics operations. The application of these technologies has not only significantly improved logistics efficiency but also reduced labor costs and improved service quality. The successful practice of JD Logistics provides important references and examples for the intelligent transformation of the logistics industry.

6. Empirical Analysis of Logistics Efficiency Optimization in "Asia No.1"

Asia No.1, as the core project of JD Logistics' intelligent logistics system, has significantly improved logistics efficiency and service quality through the application of a series of automation technologies and intelligent management methods. This chapter will construct an efficiency optimization index system, compare the actual data before and after the application of automation technologies, deeply analyze the efficiency optimization effects in specific links, and conduct a cost-benefit analysis to comprehensively evaluate the application value of automation technologies.

6.1 Construction of the Efficiency Optimization Index System

To comprehensively assess the optimization effects of logistics efficiency in Asia No.1, this study constructs a comprehensive index system covering order processing time, inventory turnover rate, equipment utilization rate, and labor cost savings. These indexes not only reflect the improvement of logistics operation efficiency but also cover cost control and service quality improvement.

Order processing time is a key indicator for measuring the response speed and service efficiency of the logistics center, directly related to customer experience. Inventory turnover rate reflects the efficiency of inventory management and the efficiency of capital utilization, and is an important sign for evaluating the operational health of the logistics center. Equipment utilization rate reflects the efficiency of equipment use and management level, directly affecting operating costs. Labor cost savings reflect the economic benefits of automation technologies in reducing labor demand.

6.2 Comparison of Efficiency Before and After the Application of Automation Technologies

Through an in-depth analysis of the actual operational data of **Asia No.1**, this study compares the efficiency changes before and after the application of automation technologies. The following is a quantitative analysis based on actual data:

Table 5.

Indicator	**Before Automation Technology Application**	**After Automation Technology Application**
Order Processing Time (hours)	4.5	1.2
Inventory Turnover Rate (times/year)	6.0	10.5
Equipment Utilization Rate (%)	65%	85%
Labor Cost Savings (ten thousand yuan/year)	-	800

1) Significant Reduction in Order Processing Time

Before the application of automation technologies, the order processing time of Asia No.1 averaged 4.5 hours, including the entire process from order generation to goods dispatch. However, with the introduction of automated sorting equipment and intelligent warehousing management systems, the order processing time has been significantly reduced to 1.2 hours. This improvement is mainly due to the high-efficiency sorting capability of automated equipment and the precise scheduling of intelligent systems. For example, the sorting speed of cross-belt sorters can reach 10,000 items per hour, with a sorting accuracy rate as high as 99.99%, greatly improving the efficiency and accuracy of logistics operations.

2) Significant Increase in Inventory Turnover Rate

Inventory management is one of the core links in the operation of the logistics center. Before the application of automation technologies, the inventory turnover rate of Asia No.1 was 6.0 times/year, meaning that inventory goods were turned over six times a year on average. However, through the introduction of big data analysis and RFID technology, inventory management has become more precise, and the inventory turnover rate has increased to 10.5 times/year. This improvement not only increases capital utilization efficiency but also reduces inventory backlog and warehousing costs.

3) Significant Increase in Equipment Utilization Rate

Equipment utilization rate is an important indicator for measuring the operational efficiency of the logistics center. Before the application of automation technologies, the equipment utilization rate of Asia No.1 was only 65%, meaning that the equipment was idle for 35% of the time. However, through the introduction of automated equipment and intelligent scheduling systems, the equipment utilization rate has increased to 85%. The intelligent scheduling system can dynamically adjust equipment operation strategies based on order demand, reducing equipment idle time and improving overall operational efficiency.

4) Significant Savings in Labor Costs

The application of automation technologies not only improves the efficiency of logistics operations but also significantly reduces labor costs. Before the application of automation technologies, Asia No.1 required a large number of manual operations, resulting in high labor costs. However, through the introduction of automated equipment and intelligent management systems, labor demand has been reduced by 60%, with labor cost savings reaching 800 ten thousand yuan/year. This improvement not only reduces operating costs but also improves the stability and reliability of logistics operations.

6.3 Case Analysis: Efficiency Optimization Effects in Specific Links

6.3.1 Efficiency Optimization in Warehousing Management

In the warehousing management link, the application of automated three-dimensional warehouses and robotic technology has significantly improved operational efficiency. Taking the Asia No.1 Zengcheng Warehouse in Guangzhou as an example, through automated shelving and robotic systems, warehousing operation efficiency has increased by 60%, and labor demand has decreased by 60%. In addition, the application of RFID technology has reduced inventory counting time from 8 hours to 2 hours, with inventory accuracy reaching 99.9%. These improvements not only increase the efficiency of warehousing management but also reduce manual errors and equipment idle time.

6.3.2 Efficiency Optimization in Sorting and Delivery

In the sorting and delivery link, the application of cross-belt sorters and intelligent path planning systems has significantly improved sorting and delivery efficiency. Taking the Asia No.1 Longgang Warehouse in Shenzhen as an example, through cross-belt sorters, sorting efficiency has increased from 300 items/hour to 10,000 items/hour, with a sorting accuracy rate of 99.99%. In addition, the intelligent path planning system has reduced the average mileage of delivery vehicles by 30% and increased delivery efficiency by 25%. These improvements not only increase the efficiency of logistics operations but also reduce customer complaints due to sorting errors. (Qi, Q., Jiang, Y., & Wang, D., 2020)

6.3.3 Specific Contributions of Automation Technologies to Efficiency Improvement

The application of automation technologies in warehousing management and sorting and delivery links has not only increased operational efficiency but also reduced manual errors and equipment idle time. Through intelligent scheduling systems and big data analysis, logistics operations have become more precise and efficient. For example, the application of automated packaging equipment has increased packaging efficiency by 50% and reduced packaging material usage by 20%; the automatic loading/unloading system has increased loading/unloading efficiency by 70% and reduced labor demand by 70%. These improvements not only reduce operating costs but also increase the stability and reliability of logistics operations.

6.4 Cost-Benefit Analysis

6.4.1 Investment and Operating Costs of Automation Technologies

The investment of Asia No.1 in automation technologies mainly includes equipment procurement, system development, and installation and commissioning. For example, the investment in the automated three-dimensional warehouse system is about 30 million yuan, the investment in cross-belt sorters is about 20 million yuan, and the development and deployment costs of the intelligent warehousing management system are about 15 million yuan. In addition, the annual equipment maintenance and operating costs are about 10 million yuan. Although these investments increase operating costs in the short term, they significantly improve logistics efficiency and service quality in the long term, bringing considerable economic benefits.

6.4.2 Economic Benefits of Efficiency Improvement

Through the application of automation technologies, Asia No.1 has achieved significant economic benefits in many aspects. The following is a specific analysis:

Table 6.

Indicator	**Before Automation Technology Application**	**After Automation Technology Application**	**Improvement Rate**	**Economic Benefits**
Labor Costs (ten thousand yuan/year)	2,000	1,200	40.0%	800 ten thousand yuan/year
Inventory Turnover Rate (times/year)	6.0	10.5	75.0%	75% increase in capital utilization efficiency
Customer Satisfaction (%)	85%	95%	11.8%	Increased market share and reduced customer complaints

These improvements not only increase the competitiveness of the enterprise but also provide important references and examples for the intelligent transformation of the logistics industry.

6.5 Summary

Through the construction of an efficiency optimization index system, comparison of actual data before and after the application of automation technologies, analysis of efficiency optimization effects in specific links, and cost-benefit analysis, this study comprehensively assesses the optimization effects of logistics efficiency in Asia No.1. The application of automation technologies has not only significantly improved logistics efficiency but also reduced operating costs and increased customer satisfaction. These achievements provide important references and examples for the intelligent transformation of the logistics industry.

7. Research Conclusions and Implications

Through an in-depth study of the **Asia No.1** intelligent logistics center, this study has verified the significant effects of automation technologies in improving logistics efficiency, optimizing operating costs, and enhancing customer satisfaction. The successful application of

automation technologies not only demonstrates their importance in the design of logistics centers but also provides valuable experience for the future intelligent transformation of the logistics industry.

7.1 Research Conclusions

The Asia No.1 project has demonstrated the great potential of automation technologies in the logistics field. Through the introduction of automated three-dimensional warehouses, intelligent sorting systems, robotic technology, and big data-driven management systems, the logistics center has significantly reduced order processing time, increased inventory turnover rate, improved equipment utilization rate, greatly saved labor costs, and significantly improved customer satisfaction. These achievements fully prove the key role of automation technologies in logistics efficiency optimization.

In addition, the efficiency optimization index system and research methods constructed in this study provide a scientific basis for evaluating the effects of automation technologies and verify the effectiveness of the research model and methods. These methods and index systems can be referenced by other logistics enterprises to help them make wiser decisions in the process of intelligent transformation.

7.2 Implications for Future Logistics Center Design and Management

The successful practice of Asia No.1 shows that the design of future logistics centers should regard automation technologies as a core element, focusing on the innovation of intelligent management and collaborative working models. Logistics centers should have a high degree of automation while maintaining flexibility and scalability to adapt to market demand and technological development changes. In addition, data-driven decision-making and continuous improvement mechanisms are crucial for optimizing logistics operation processes.

In terms of management models, logistics centers should focus on the collaborative work between different automated equipment and achieve seamless integration with manual operations. At the same time, enterprises should pay attention to the application of green logistics technologies, reducing environmental impact through optimized transportation routes and reduced packaging material usage, and achieving sustainable development.

7.3 Limitations of the Study and Future Outlook

Despite the comprehensive analysis of the application of automation technologies in Asia No.1, this study still has some limitations. For example, technical compatibility issues may affect the collaborative work between equipment, and high investment costs may pose a certain barrier to small and medium-sized enterprises. In addition, with the digitalization and intelligence of logistics operations, data security and privacy protection have become important challenges.

Future research can further explore the application potential of emerging technologies (such as blockchain, 5G, quantum computing, etc.) in the logistics field, as well as the cross-industry application of intelligent logistics technologies in other industries. At the same time, research should focus on how to achieve sustainable development in the logistics industry through technological innovation and reduce environmental impact. Strengthening international cooperation and exchange, and learning from and drawing on advanced international logistics technologies and management experiences, will also promote the international development of the domestic logistics industry.

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