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Intelligent Logistics under Artificial Intelligence and Big Data

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Abstract: With the development of science and technology, high-tech technologies such as artificial intelligence and big data are gradually being applied to daily life. Digitalization has become a new driving force for the transformation and upgrading of the logistics industry, and there are many problems in the current logistics market. The logistics industry has developed rapidly, but the problems of low inventory management and transportation efficiency have not been effectively solved. Research in the field of logistics should not be limited to certain aspects, but should take a holistic approach. It is very meaningful to effectively combine existing advanced technology with existing logistics, strengthen the scientific management of employees, and improve logistics efficiency. This article elaborates on the basic concept of intelligent logistics and analyzes the advantages of applying technology to logistics through scientific analysis methods, combining advanced technology with logistics can effectively avoid the shortcomings of traditional logistics, and improve management efficiency and service quality, hopes to explore and provide suggestions for the development of logistics and intelligent logistics.

Keywords: intelligent logistics, big data, artificial intelligence, management model

1. Introduction

With the rapid development of science and technology, big data and artificial intelligence technology have been widely applied to people's work and lives. Most of the original innovation in the logistics industry is to improve and strengthen the steps in a single link. Applying big data and other technologies to logistics can have a profound impact on the overall logistics industry. Intelligent logistics utilizes advanced technology to effectively integrate big data, artificial intelligence technology, and logistics services. Using digital and intelligent technologies to promote high-quality development of the logistics industry, achieve deep integration of digital economy and industrial chain supply chain, has become the theme of current logistics industry development.

This paper uses the SWOT analysis method, Porter's Five Forces model, and commercial canvas to analyze the advantages of intelligent logistics, and explores the development of intelligent logistics based on practical cases. The emergence of big data and the development of related technologies provide an opportunity to solve these existing problems, and intelligent logistics will gradually become the main trend of future logistics industry development. The innovation revolution in the logistics industry is underway, and it is currently an industry with innovative potential. The success

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of the intelligent innovation revolution in the logistics industry will also extend to various other industries and fields. The future development of intelligent logistics has bright prospects.

2. Analysis of Existing Problems in the Logistics Market

With the rapid development of e-commerce and cross-border trade, the logistics industry is also constantly growing. However, there are still many problems in the logistics industry, such as low efficiency, slow delivery speed, and significant safety hazards. At present, the human resource allocation and informatization level of the logistics industry are not high, leading to low logistics efficiency [1]. Especially when dealing with a large number of orders, logistics companies often fail to process and ship in a timely manner, thereby affecting customer satisfaction. Due to the diverse types of items in logistics delivery, the storage, sorting, and distribution processes take a long time, making it difficult to guarantee strict logistics delivery time. This has caused unnecessary trouble and waiting for customers, and also affected the image and reputation of the logistics industry [2]. Logistics enterprises may have problems in some aspects of supervision and management, and the management system is not perfect and sound enough. The circulation of goods is not strictly carried out in accordance with regulations, and the personnel and management departments responsible for supervision are chaotic, resulting in low work efficiency of logistics enterprises and unsmooth operation, making it difficult to bring significant benefits to the enterprise.

3. Analysis of the Advantages of Big Data and Artificial Intelligence Technology

3.1. The Advantages of Big Data Technology for the Logistics Industry

Big data has significant advantages over traditional data collection methods. Big data has a strong ability to obtain information, store and retain detailed information about the enterprise, track and analyze the whereabouts of various data in real-time, and manage internal information and data within the enterprise [3]. Logistics enterprises establish big data systems to store and manage complex logistics information, and process data in specific situations. Widely applying big data to the logistics industry can bring great convenience to logistics work. Big data technology is applied to logistics work, scientifically and reasonably planning the transportation routes of goods, reducing the transportation costs and losses of goods during the transportation process. By transmitting and utilizing remote data, we can accurately grasp the specific transportation situation of goods in various regions, clarify the specific steps of different goods on different routes, understand the completeness of goods during transportation, and ensure that we provide higher-quality services for shopping customers [4]. After the completion of the goods transportation process, the information can also be fed back in real-time by big data, providing clearer solutions for the after-sales service of goods. The application of big data technology in logistics enterprises can bring more economic benefits and good reputation to enterprises, and improve their competitiveness.

3.2. The Advantages of Artificial Intelligence Technology for the Logistics Industry

Artificial intelligence, as the core intelligent technology for intelligent logistics, can intelligently process various types of logistics information, analyze known information, and help logistics personnel make decisions [5]. Applying artificial intelligence to logistics can help logistics enterprises transport goods. Through the calculation and analysis of artificial intelligence, the optimal combination and transportation path of goods can be achieved, and a detailed planning of the overall logistics plan can be carried out. Artificial intelligence can optimize transportation routes, select the best solution based on real-time traffic volume in various regions, and strictly control implementation. Intelligent logistics, combined with artificial intelligence, helps logistics achieve intelligence and

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improve logistics efficiency. Artificial intelligence can cooperate with big data technology to fully utilize the massive data collected by big data. Big data supports and provides artificial intelligence with analytical capabilities, facilitates deep-level mining and analysis of data by artificial intelligence.

3.3. The Advantages of Other Technologies for the Logistics Industry

Other intelligent advanced technologies can also greatly assist logistics. For example, the key Internet of Things technology. Through the Internet of Things technology, staff can interconnect various types of goods and transmit data, which is conducive to the digitalization of the logistics industry [6]. The Internet of Things technology can collect, transmit, and monitor logistics information in real-time, and assist in intelligent decision-making through the collected information. Other advanced technologies can help track and manage goods, monitor and manage their status in real time, improve logistics efficiency, and ensure the quality of the logistics process.

4. Overall Explanation of Intelligent Logistics

Intelligent logistics is the use of various advanced technologies to intelligently process information. Store and analyze the data, optimize the known information obtained, and after analysis, staff can make decisions and execute the decision content. Smart logistics relies on informatization to share and collaborate on various types of information. Intelligent logistics optimizes infrastructure and transportation links. Smart logistics is different from traditional logistics and is not limited to the transportation of goods. It uses advanced technology to manage goods and integrate resources: intelligent logistics technology, logistics models, logistics data, and other aspects. With the development of internationalization and the globalization of the economy, the quantity and scale of international trade are constantly expanding, and domestic logistics are also gradually moving towards internationalization [7]. Intelligent logistics efficiently uses artificial intelligence technology to conduct comprehensive and in-depth analysis of the actual situation of logistics transportation, and determines the best logistics route through scientific planning to improve logistics efficiency. Position the transported goods and quickly and accurately collect logistics information. Smart logistics can also promote green environmental protection, and protecting the environment is very important for the logistics industry. Logistics technology strengthens the assembly, storage, and transportation of express delivery, and promotes green and environmentally friendly development. Smart logistics can analyze based on actual situations, save time in various logistics links, reduce environmental pollution, and ensure green and sustainable development [8]. Intelligent logistics includes modules such as data collection, intelligent analysis, decision-making, and execution. Smart logistics requires the collection of various information and data in the logistics system, and accurate real-time data on the storage situation, transportation routes, and traffic conditions of the warehouse. Analyze and process the collected information, extract the high-value information, and conduct a detailed analysis of each type of goods. Then the staff makes decisions based on these foundations, selecting the optimal transportation method, transportation route, and assembly plan. Finally, strict and standardized implementation of all aspects of logistics, such as loading and unloading of goods, transportation, express delivery, etc.

5. Various Analyses of Intelligent Logistics

5.1. SWOT Analysis of Intelligent Logistics

SWOT analysis of intelligent logistics can analyze its advantages as using advanced technologies such as the Internet of Things to improve the quality and efficiency of logistics services and provide customers with stable logistics solutions. Its weakness lies in the high cost of technology and the need

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for significant financial support, which may cause financial pressure. Market demand does not necessarily accept new logistics operation models, but requires market education and promotion. The opportunity is that with the continuous expansion of e-commerce scale, the market demand in the logistics industry will continue to grow. The rapid development and application of new technologies will provide more development opportunities for smart logistics. The threat lies in the fierce market competition and the emergence of competitive products that may put pressure on the company's market share and profitability. The continuous adjustment of regulatory policies has brought uncertainty to the company's business development.

5.2. Porter's Five Forces Analysis on Smart Logistics

Conducting Porter's Five Forces analysis on intelligent logistics, its new entrants pose a threat that entering the logistics industry requires a significant investment, and the logistics industry also needs to face some industry barriers, such as obtaining a logistics license. Its buyers have bargaining power for intelligent logistics customers, including commercial and individual users. These customers have a certain bargaining power and can negotiate terms related to prices and service standards, which puts pressure on intelligent logistics operations. The threat of its alternative products is that the logistics industry has some alternative solutions, such as express delivery companies, which may have an impact on the market share and revenue of intelligent logistics. The level of competition among its competitors is that intelligent logistics faces competition from various logistics operators, e-commerce platforms, and other start-up companies. These competitors have a certain market share and brand awareness, causing certain pressure on the market competition of smart logistics. Its supplier bargaining power is that intelligent logistics requires a large amount of logistics facility procurement. Suppliers have a certain degree of monopoly and concentration in logistics equipment and technology, therefore they have a certain bargaining power, which may affect the cost and quality of smart logistics.

5.3. Commercial Canvas

The key partners of intelligent logistics are those who own logistics fleets, manufacturers, information platforms, etc. Its Key Resources are People, Technology, and Partners. Customer Relation provides comprehensive solutions, consulting services, communication, and long-term connections. Key Activities is a logistics operation management and technology research and development. Value Proposition utilizes technologies such as the Internet of Things and big data to effectively improve logistics efficiency and reduce costs. Channel is an online e-commerce platform. Customer segmentation refers to commercial users, such as other enterprises, e-commerce and operators, as well as individual consumers. The cost structure includes logistics equipment, technology investment, related operating costs, and personnel costs. Revenue Steams refer to logistics service fees and revenue sharing with relevant partners and platforms.

5.4. Case Analysis

There are many robots working on the shelves of the Beijing Smart Logistics Park, and staff use scanners to scan the goods inside, select them accurately, and then package and ship them, ensuring accuracy and efficiency. The internal space of the park has undergone intelligent calculation and analysis, fully utilizing various spaces to ensure the safe storage of goods, reflecting digitalization and intelligence. The park fully utilizes big data and artificial intelligence to improve the logistics steps, improve the time efficiency of logistics services, handle various situations, ensure the reliability of the entire logistics process, and greatly help improve the efficiency of the logistics market, reducing logistics costs. Within the smart logistics park, logistics network optimization, industrial integration

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and innovation, expansion of traffic scale, strengthening of industrial clusters, continuous promotion of logistics intermodal transportation, implementation of green and low-carbon, and full efforts to achieve dual circulation and high standards. The logistics industry is moving towards digitization, unmanned operation, and a new internet model. As a pilot of innovative logistics models, Beijing Smart Logistics Park can promote the development of the logistics industry in the region, further improve the efficiency and quality of logistics services in the industry, and benefit both merchants and consumers. Beijing Smart Logistics Park is developing vigorously and believes that with new technologies and models in the future, a more developed and complete logistics system can be developed.

6. Management Strategies and Suggestions for Intelligent Logistics

6.1. Increase Investment in Intelligent Facility Construction, Intelligent Research and Development

The development of intelligent logistics requires the construction of intelligent facilities and investment in technological research and development. Intelligent facilities are the fundamental guarantee for the development of intelligent logistics and play a crucial role in the development of smart logistics. Logistics enterprises should attach importance to the construction of internal facilities, enhance their competitiveness in the industry, pay attention to talent and technological research and development, and promote the operation and profitability of the enterprise. Government departments can provide assistance for the development of smart logistics, introduce relevant policies, and strengthen the infrastructure construction of logistics parks. People need to continuously improve and develop logistics information platforms and related technologies such as positioning and data collection to ensure the basic development of the logistics industry [9]. Technology is the foundation of progress, and we need to increase investment in technology research and development. Smart logistics enterprises can establish cooperation mechanisms with research institutions to provide professional personnel for the development of the logistics industry. Internal enterprises should attach importance to talent cultivation, inject fresh vitality into the enterprise, train employees, ensure that the enterprise is in advanced work concepts and methods, and promote innovative development of the enterprise. A sound and scientific incentive mechanism can enhance the enthusiasm of employees and enhance the cohesion of the enterprise.

6.2. Build the Logistics Information Platform

Intelligent logistics needs to strengthen the level of digitization and build a shared logistics information platform. Real-time monitoring and dynamic analysis of data in various stages of logistics transportation should be achieved to achieve full process information tracking, and data sharing within logistics enterprises, optimize logistics resource allocation, and provide convenience for logistics transportation [10]. To achieve comprehensive data analysis and reprocessing, ensure data accuracy, and determine the value of the data. Classify and process according to customer needs and product categories, optimize enterprise transportation routes through shared logistics information platforms, coordinate materials, upgrade transportation modes, and provide convenience for users. The government can encourage the construction and improvement of logistics information platforms, provide policy support, strengthen platform supervision and management, strengthen user connections between platforms, and achieve mutual benefit.

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7. Conclusion

In the context of big data, the Internet of Things, and artificial intelligence, the importance of the logistics industry is constantly increasing. Intelligent logistics is an innovation in the logistics industry under high-tech conditions. The logistics industry has become an indispensable service industry in people's daily lives, and its status is gradually improving. This article analyzes and explores the design and development of intelligent logistics, comprehensively analyzes intelligent logistics through scientific analysis methods, and introduces practical cases of intelligent logistics parks. Smart logistics can be continuously upgraded and innovated with the development of high-tech, and logistics management models can also be continuously improved and optimized. The development of smart logistics requires increasing investment in infrastructure construction and research and development, promoting the construction of shared information platforms, promoting industrial structure upgrading, and improving the economic benefits of logistics enterprises. Smart logistics has explored the future development direction of logistics and become a trend in the logistics industry. However, the analysis of various aspects of smart logistics is not yet complete, and the development prospects of smart logistics require more practical cases and data to support analysis. The development of smart logistics will also face some challenges. The digitization of smart logistics needs to ensure data security and privacy security. Relevant logistics companies will face technological updates and personnel training to adapt to the development needs of smart logistics. The digital and intelligent development trend of the logistics industry can be extended to other industries, such as healthcare and catering. The innovation revolution in the logistics industry is rapidly progressing, and as an attractive and innovative industry, people can look forward to its bright future of efficient, safe, and green development.

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