Optimization of E-Commerce Logistics System Based on Artificial Intelligence Technology

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Abstract. With the improvement of China's social and economic development level, the requirements for logistics efficiency are becoming more and more stringent. Artificial intelligence technology is the current direction of vigorous development. With the development of the Chinese era, in order to better promote the development of China's urbanization, this technology has been widely used in various fields in our country and occupies an important position in various fields. With the continuous innovation of artificial intelligence technology, various industries are undergoing industrial upgrading and format conversion. E-commerce logistics bear the brunt. This article mainly discusses the application of artificial intelligence in the e-commerce logistics system, and applies it to the e-commerce logistics industry. With the help of artificial intelligence algorithms, it is used to accurately calculate the supply and demand relationship of goods and the optimal path of actual logistics distribution. The selection provides algorithm-level support. The use of artificial intelligence can not only accurately predict inventory, but also play a role in optimizing inventory measures. With this technology, the automation level of the logistics sorting period can be effectively improved, highlighting the application value of artificial intelligence technology and promoting China the development process of modern e-commerce logistics industry makes it possible to develop in the direction of intelligence and automation. The experimental results show that the e-commerce logistics industry has great convenience for the sales and transportation of goods under the condition of combining artificial intelligence technology, and it has higher efficiency than traditional e-commerce logistics.

Keywords: Artificial Intelligence, E-commerce, Logistics, System Optimization

1. Introduction

Although industrial intelligence has been developing for over 40 years. Although there is still no uniform definition of artificial intelligence [1]. Although there are different definitions and definitions in the scientific environment, it is, in fact, scientific knowledge, design and use of smart machines or systems. Smart human intelligence and human enlargement. Computer applications, computer information, computer information, and human intelligence can change the world's ability to
understand and change the world through psychological activity [2]. The art of a science is how to build smart machines or smart research systems that simulate human intelligence to delay the increase in human information from the latest development of mechanical information. Special information to the public data owners of industrial intelligence to self-intelligence systems, the development of industrial information technology, the choice of logic distribution routes, the research technology in the identification of patterns, Computer vision technology comes to London, like the choice and identification of its application in [3, 4].

Due to the slow development of China's express delivery industry, it is still in the initial stage of development, and the level of development is far below the level of developed countries [5]. For the entire logistics industry, because many logistics workers still work as simple package delivery, the information management used in traditional logistics transportation is relatively backward, and there is no more advanced management of logistics information. In addition, the most widely used and most popular in China is still the traditional logistics model [6]. In the traditional e-commerce logistics system, there are a series of problems in all aspects of goods transportation, such as the inevitable risks in the transportation of goods, and the related transportation links and the operation methods of e-commerce logistics enterprises. Will have a considerable impact on e-commerce logistics. Through the application of artificial intelligence technology, many problems encountered in the process of logistics transportation can be solved [7].

The application of artificial intelligence technology in the logistics system is mainly reflected in the following aspects: intelligent classification, route planning and other related fields [8]. Many aspects have been solved in these related fields, such as storage links, inventory management, transportation route planning, etc. According to the current express transportation industry structure, logistics warehousing is the foundation of the development of modern logistics industry. Therefore, when finding a location for a storage point, artificial intelligence can select the most suitable location according to the selection criteria, including selecting the location of customers, suppliers, and manufacturers, economic considerations of transportation, labor availability, and construction costs. Conditions accurately filter a series of tax systems [9]. The location of artificial intelligence technology eliminates the participation of human and personal emotions, which makes site selection more possible, can find addresses that meet the screening conditions, and greatly reduce logistics costs. On the other hand, the application of artificial intelligence technology in the field of e-commerce logistics can effectively solve a series of problems in the modern logistics system [10].

2. Method

2.1. Statistical Methods

When the expected count is small (theoretical frequency T<5), the Fisher's exact test is used. P<0.05 indicates significant difference. Statistical significance. If a function g(f) satisfies the following relationship:

\[ \frac{P_r(x_{i=0}|r,S)}{P_r(x_{i=1}|r,S)} \geq 1 \]

The space formed by the function g(f) is called the square integrable space, that is, g(t) ∈ (R). From this formula, we know that g(t) is an energy finite function.

If the function y(f) ∈ (t), its corresponding Fourier transform is, when the condition is met:

\[ \frac{1}{2} \left( 1 + (1 - 2R^l) \right) \]

It is called a basic wavelet function. After the function is translated and stretched, the result is a wavelet sequence:

\[ R_0^l = \frac{1}{2} \left( 1 + (1 - 2R^l) \right) \]
The above probability is:

\[ R_{1-j}^1 = 1 - R_{1-j}^0 \]  

(4)

The above formula leads to the following ruling:

\[
\begin{cases} 
    x_j = 0 \\
    x_j = 1 
\end{cases} 
\]

(5)

2.2. Automated Warehousing

At present, the main performance of intelligent storage is an automated three-dimensional warehouse. There is no direct manual operation condition. The handling operation is safe and reliable. Under the control of the computer, there are many cargo cranes in the warehouse to quickly locate to stack standard paper trays, and carry out accurate retrieval at the fastest speed, meeting the shortest distance logistics industry of modern cargo receiving and dispatching needs rapid circulation. For example, in the warehouse planning link, one of the most obvious advantages is to optimize the location of the distribution center. According to the actual environment constraints, such as the geographical location of the guest family, the supplier and the origin, the transportation cost and other related comprehensive optimization, through artificial intelligence With a technological decision-making system, the transportation of goods can no longer completely follow the traditional mode of transportation to strive for the least course, but start from the calculated results, combine the relevant big data comprehensive analysis, and consider the time and space factors to give The best solution for the goods transportation process. Compared with traditional positioning, artificial intelligence technology can solve the complex problem of too many variables in material warehouse location. Through artificial intelligence combined with relevant actual conditions and constraints, different supplier tax policies are allocated, resource acquisition and economic convenience, labor costs and income have been fully simulated and calculated, and factors such as difficulty levels have been fully reflected, learning and optimization, Get the best location of the material warehouse, make the location more convenient for accuracy, to reduce the construction and operating costs of the enterprise, and reduce the human factor to increase the profit of the enterprise.

2.3. Strengthen the Training of Talents in the E-Commerce Logistics Industry

Since ancient times, talents have been one of the factors that measure the total strength of a country. National development and national rejuvenation are inseparable from talents. With abundant talents, there is sufficient guarantee. The further development of my country's economy and e-commerce logistics industry is inseparable from the participation of high-quality talents. Therefore, under the current social background, the country should pay more attention to the reserve and training of talents in related industries, and improve the talents of the e-commerce logistics industry through various channels. Comprehensive quality and professional ability. For example, through the construction of national colleges and universities, the training of e-commerce logistics talents can be increased in colleges and universities. In the training process, it is not only necessary to cultivate theoretical knowledge, but also to cultivate their practical ability and moral cultivation. Strict professional requirements and increase teaching efforts. Combining with the market and the domestic e-commerce logistics industry environment, targeted training can be carried out, so that all links have sufficient talent reserves to meet the talents required by e-commerce logistics.

3. Experiment

3.1. Experimental Investigation Objects

In order to further analyze the current status of the e-commerce logistics industry, and understand the role of artificial intelligence technology in the industry, analyze the pros and cons of artificial intelligence technology. This paper selects an e-commerce and logistics distribution center in a certain
place to conduct a questionnaire survey, and based on the data of the survey results, we can get the multi-faceted impact of artificial intelligence technology on the logistics industry. On the basis of comprehensively combing the research results of the research objects on the research theme of this article, this article analyzes the problems and causes of the problems studied in this article based on the data obtained. Through comprehensive processing and analysis of data.

3.2. Experimental Research Design
This survey is aimed at conducting the questionnaire on the spot, and selectively distributed 100 experimental questionnaires to the e-commerce merchants and the staff of the logistics distribution center in the region, respectively, the use of artificial intelligence technology for e-commerce transactions. Secondly, understand the current status of artificial intelligence technology in the e-commerce logistics industry, objectively analyze its existing problems, explore the causes of the problems, and learn from the development of artificial intelligence technology in the big data era since the development of artificial intelligence technology in the e-commerce logistics industry. Relevant research on application and function play puts forward the countermeasures of how to build and function artificial intelligence technology in the e-commerce logistics industry. Experimental results.

| Table 1. Questionnaire statistics |
|----------------------------------|
| Questionnaire statistics         | Recycle | Missing | total |
| Percentage                      | 93%     | 7%      | 100%  |

4. Results

4.1. Experimental Results

Figure 1. Does the use of artificial intelligence technology affect e-commerce transaction volume?

The data shown in Figure 1 is a survey of e-commerce merchants in the region. From the data in the figure, it can be seen that the use of artificial intelligence technology still has a very large impact on the transaction volume of e-commerce. The mainstream ideology of e-commerce merchants has had a certain degree of influence. 83.87% of merchants believe that the use of artificial intelligence technology has a great impact on the transaction volume of e-commerce, 8.60% of e-commerce merchants believe that the impact of this technology is greater, and 5.38% of e-commerce merchants believe that the impact of this technology is not significant, 1.10% Of e-commerce merchants believe that the technology has no effect on them. According to the results of this survey, artificial intelligence technology has a great influence in increasing the transaction volume of e-commerce. With the support of this technology, e-commerce merchants have reduced a lot of burdens in the process of selling goods online. But also increased their transaction volume.
intelligence technology in the field of e-commerce has brought great changes to the work of e-commerce merchants, and is of great significance to the development of e-commerce.

![Figure 2. Efficiency of goods distribution](image)

From the data in Figure 2, we can understand the current delivery efficiency of goods combined with artificial intelligence technology in the logistics and transportation industry. According to the data, 91.40% of the questionnaires show that the delivery efficiency of this technology is used in the delivery process of goods. There is a huge improvement. 7.53% of the questionnaires show that the delivery efficiency is not improved, and 1.10% of the questionnaires show that the delivery efficiency is not improved. Making good use of artificial intelligence technology in the e-commerce logistics industry is of great significance to the development of the industry. The use of related technologies to carry out storage links, inventory management, and transportation route planning in related fields has greatly promoted the development of the e-commerce logistics industry.

With the development of social economy, the e-commerce logistics industry is also booming. The e-commerce logistics industry is also facing new development challenges. While facing new challenges, we can better develop and survive in the fierce market competition, the logistics industry must keep pace with the times and expand the application of intelligent technology for related talents. On the one hand, in order to use artificial intelligence for logistics distribution, logistics companies can improve distribution efficiency and reduce distribution costs through unmanned distribution methods. On the other hand, logistics enterprises are people-oriented. Intelligent network management programs can be used to predict whether logistics can be delivered on time and plan ahead. In addition, logistics companies should also use artificial intelligence to enhance the user’s service experience, thereby increasing the significance of customer satisfaction.

5. Conclusion

By increasing the use of industrial information technology, both electronic and logistics markets will be better. Electrical commerce technologies are very easy to sell and transfer drugs in terms of the combination of art and more efficient information technologies compared to the classical physics of commerce. Supporting the rapid development of industrial information technology, we see the rapid development of destructive changes in the logistics industry in electronics. With the development of society, the logic of modern electronic commerce is not limited to traditional support, but the technologies of industrial information in the technological commerce are developing in many technologies. Logic commerce industry solves a number of problems through computational simulation such as customer geography, producers and main sites, transfer costs and other products. At the same time, we will continue to expect more innovations and more applications to develop Chinese technology in business. We develop electronics and serve art information technology better for society and society.
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