Artificial intelligence technology in modern logistics system

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Abstract: The purpose of this article is to conduct a detailed analysis and research on modern automated logistics systems by combining artificial intelligence technology with logistics systems. This paper introduces in detail the current situation of artificial intelligence application and the application of this technology in modern logistics systems, and systematically discusses the feasibility of artificial intelligence technology to realise automation in modern logistics systems. The research results show that it is feasible to apply artificial intelligence technology to modern automated logistics systems, and artificial intelligence and logistics have become an irreversible development trend. Compared with traditional logistics systems, the use of artificial modern logistics system intelligent technology can increase work efficiency by 25% and reduce logistics costs by about 31%.

Keywords: artificial intelligence; logistics system; automatics; technology application; logistics transportation; automation technology; logistics efficiency.

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1 Introduction

Since the 1980s, driven by reform and opening up policies, China's economy has begun to develop at a high speed (Ye et al., 2017). Under the state-led strategy of technological innovation, artificial intelligence 'algorithms' have gradually overturned simple human mental labour, and artificial intelligence has gradually become the 'new engine' for the development of the global logistics economy (Broda and Frank, 2015). Many logistics companies have opened up a new era of logistics using artificial intelligence technology. Ma Yun has built a rookie network intelligent logistics node. Artificial intelligence has gradually penetrated into the field of logistics, overturning the traditional logistics model, and has become an irreversible trend in the logistics industry (Fumagalli et al., 2016). The development trend of transformation and upgrading of logistics enterprises in the future artificial intelligence era, and promote the integration of artificial intelligence and logistics enterprises Development has important practical significance (Wang, 2017). Among them, logistics refers to the unified arrangement of materials production, procurement, transportation, and distribution during the war, in order to reduce the cost of supplies, faster, and better services (Stoyanov et al., 2016). Technology science, and management science, and reveals transportation, storage, handling, packaging, distribution processing, and information processing. The internal relations of various elements of logistics, etc. (Barcelona et al., 2016). In economically developed countries, it is regarded as the 'third source of profit' after raw materials and labour, and it is the last virgin place to reduce costs.

At present, the application of artificial intelligence technology in modern logistics systems has gradually matured, and its main manifestation is in modern logistics systems such as intelligent logistics (Keming, 2015). A modern and more convenient sales model. The e-commerce industry has launched a new wave of online shopping through various new publicity methods such as spike, group purchases, and holiday promotions. However, the current level of China's logistics industry cannot meet the needs of e-commerce services High standards of efficiency and service quality are required (Coetzee, 2015). Inefficient logistics will also consume more energy, cause more carbon emissions, and cause great harm to the natural environment. These have greatly deviated from the era of energy conservation and emission reduction (Antal and Bandi, 2017). Waste of energy, unreasonable scheduling, and inefficient integration of different modules have further increased operating costs and reduced corporate profits (Krug et al., 2017).

In order to explore the impact of artificial intelligence technology on modern logistics, this paper studies the application of artificial intelligence technology in modern logistics systems. Among them, Kun gave a detailed introduction to artificial intelligence technology, and pointed out the importance and feasibility of artificial intelligence technology (Kunpeng et al., 2015). Gan proposed the application of artificial intelligence technology in the control system in his paper, and expounded the development status of artificial intelligence technology and the main technical problems existing in it, and made a solution to this (Gan, 2015). ZHU explained in detail the superiority of artificial intelligence technology in the analysis and processing of experimental data (Zhu et al., 2015). Dotoli proposed some common problems in artificial intelligence technology, and put forward ideas for the problems that may be encountered in various industries (Dotoli et al., 2015). Schumann proposed some common problems of traditional logistics systems in modern logistics systems, and proposed ideas for the problems that may be encountered in the realisation of automation (Schumann et al., 2015). Ján proposed the importance of modern logistics system to promote economic development, and it is essential to carry out related work (Jánošík et al., 2016). Christoph proposed a modern logistics system based on big data, and explained the importance of the development of modern logistics system (Löffler and Canders, 2015). Davies analysed the future development direction of the logistics system, especially elaborated on the application of artificial intelligence and other technologies in this field (Davies and Maj, 2017). Tan proposed a modern logistics system based on artificial intelligence technology, which provides research directions for the study of artificial intelligence technology in the application of logistics automation technology (Tan et al., 2016). Nima puts forward the fields and related contents of the application of automation technology in logistics systems based on artificial intelligence technology, which lays a theoretical foundation for the study of the application of artificial intelligence technology in modern logistics systems (Darav et al., 2016).

Specifically, the main research content of this paper is roughly divided into five parts: the first part is the introduction part, which aims to systematically review the main research content of this paper from the research background, research purpose, research ideas and methods; the second part is The theoretical basis, a detailed and systematic summary of the current research status of logistics systems and artificial intelligence technology, and also introduces the current application of artificial intelligence technology in logistics. The third part is related research, which expounds the current status of automation technology application of artificial intelligence technology in modern logistics system by querying data and conducting relevant experiments. The fourth part is the analysis of the data. Through specific survey data and research results, the impact of artificial intelligence technology on modern logistics is verified from various aspects such as logistics costs and logistics efficiency. The fifth part is the summary and recommendations of this paper. The summary of the results of this paper and the prospect of the further application of artificial intelligence technology in modern logistics systems.

2 Proposed method

2.1 Development and application of artificial intelligence technology

The development of artificial intelligence technology has received much attention in recent years. Human-like intelligent technology that uses ordinary computer programs to achieve its purpose is a universal definition of artificial intelligence technology in various countries. In other words, artificial intelligence technology simulates human intelligence (Treccani et al., 2016). There are many applications of artificial intelligence in various industries, including not only expert systems, natural language processing, problem solving, artificial neural networks, artificial life, pattern recognition, theorem proof, robotics, machine learning, automatic programming, intelligent decision systems, etc. Moreover, on the whole, artificial intelligence technology can be said to be a highly comprehensive discipline. In recent years, the research and application fields of artificial intelligence technology have become more extensive (Goharimanesh et al., 2016). In addition, with the development and progress of the times, after more than ten years of development experience, it has developed to the present. Its current main application areas include artificial intelligence technology, which is widely used in life applications. Artificial intelligence technology involves many algorithms, of which various data processing algorithms are commonly used, as shown in formulas (1) and (2):

$$E(A) = \sum_{J=1}^{V} \frac{D_f}{D} * Info(D_f) \tag{1}$$

$$C_j = \{t_i \mid f(x) = C_f 1 <= i <= n, 1 <= j <= n \tag{2}$$

In the past five years, with the support of internet technology, information technology and big data, artificial intelligence in China has begun to flourish, and related fields of artificial intelligence have also developed rapidly, and the application areas of artificial intelligence have become more and more extensive. China's overall innovation capability has been continuously improved, and it has become one of the fastest intelligent countries in the world. Although compared with foreign countries, the research on the development of artificial intelligence in China started late, and there are still many problems in its technology application. However, after long-term development, artificial intelligence has shown a vigorous development trend. In the industrial chain formed by the development of artificial intelligence in China, although many companies have relatively short establishment times, most of them are start-up companies (Wang, 2015). However, these companies have a good development momentum and have great development potential and application prospects. Some companies have developed into excellent artificial intelligence companies by virtue of their own advantages in technology, capital, and data. Among them, representative companies include Bai du and Alibaba, Tencent, HKUST Xanrey, etc. The continuous development of artificial intelligence technology depends on the development of various aspects of technology, including the continuous development of optimisation algorithms to provide methods for its various functions. Part of the algorithm, as shown in formulas (3) and (4):

$$\tau_{ii}(t+1) = \rho\tau_{ii}(t) + \Delta\tau_{ii} \tag{3}$$

$$\Delta\tau_{ii} = \sum_{k=1}^{i+1} \Delta\tau_{ii}^{k} \tag{4}$$

In addition, from the perspective of macro strategy, the development of China's artificial intelligence has also received national recognition and strong support, fully affirming the important role of artificial intelligence in economic and social development. Judging from a series of artificial intelligence-related policy plans issued by the state: artificial intelligence has become a technology development area that the country attaches great importance to, and it has also become a new driving force for economic development, a new focus for improving the country's competitiveness, and protecting people's livelihood New means. With the active promotion of the country and all sectors of society, with the support of rich R & D investment, high-level technical talent reserves, and sufficient funds, China's artificial intelligence will surely gain rapid development, thus entering a new era of vigorous development (Gonçalves e Silva, 2015).The development of artificial intelligence and Application will inevitably become a key factor in promoting rapid national development, urban intelligence, and social modernisation. Artificial intelligence technology has begun to apply to every aspect of our lives.

2.2 Automation technology in modern logistics system

Logistics has been in development for a long time, and in the face of the demand for high efficiency and large quantities, the updating and development of logistics systems has been keeping up with the times. Modern production logistics system usually consists of three parts: management layer! Control layer and execution layer. The management layer is the centre of the system, and can transport the materials according to the production plan! The corresponding plans are completed for storage and loading and unloading! Organisation and control management the 'execution layer' is composed of automated logistics machinery. Equipment performs various operations "and the control layer is an important part of the logistics system". It receives commands from the management layer, controls the logistics machinery to complete the tasks specified by the instructions, and monitors the status of the logistics system in real time, such as the status of logistics equipment and logistics transportation. Situation, the coordination and cooperation of various parts of the logistics system, etc., to timely find problems in the production line, and apply the scheduling and evaluation results of the production line to the scheduling control of the actual production line to improve the management level and improve production efficiency and quality. Important role (Li et al., 2015). The level of logistics management requires evaluation and estimation, and the evaluation algorithm is shown in Equation 5:

$$t_i = \max\left\{\frac{\Delta x}{v_i}, \frac{\Delta y}{v_j}\right\} = \max\left\{\frac{x_2 - x_1}{v_x}, \frac{y_2 - y_1}{v_y}\right\} \tag{5}$$

Logistics system information processing automation: Management is a system with data processing capabilities and intelligent requirements. The control layer is an important part of the logistics system. It receives commands from the management layer to control the logistics machinery to complete the tasks specified in the instruction. "The control layer itself has insufficient data processing capabilities. If it receives information from the execution layer", the control layer has another task. It monitors the status of the logistics system in real time, such as the status of logistics equipment! The situation of material transportation! The coordination and coordination of various parts of the logistics system etc. The monitoring situation is fed back to the management, which provides a reference for the management's scheduling decisions. "The controller of the logistics equipment accepts the order of the control layer, and the control equipment performs various operations". The requirements of each level of the logistics system are different according to the division of labour between the control layer and the executive layer of the management layer. The control layer requires high real-time performance. The execution layer requires high reliability. The algorithm for judging the reliability of the automation work of the execution layer is shown in formulas (6) and (7):

$$x = r_1 x\left[1 - \frac{x}{1 + a_1 y}\right] \tag{6}$$

$$y = r_1 y\left[1 - \frac{x}{1 + a_2 x}\right] \tag{7}$$

Logistics monitoring system automation. In modern advanced manufacturing technology, a key link is the rapid collection and processing of information. Once defects or equipment failures are found, they can be found in time to take corresponding measures. "Finding and eliminating the source of failures in time will greatly reduce interruptions". The demand for inventory in the operation process reduces inventory costs, so the monitoring and communication of logistics equipment affects the operation of the entire production system, which is one of the key technologies of modern production logistics systems. Logistics warehouse management automation, automated three-dimensional warehouses are important for logistics systems in the link, it encodes, stores, unloads, sorts, etc. the stored materials through the warehouse management monitoring computer, and automatically completes the storage and transportation of materials. The automated three-dimensional warehouse mainly consists of high-level shelves, automatic storage equipment for materials, it consists of conveying equipment, sorting system and computer management and monitoring equipment. According to the function, the automated three-dimensional warehouse can be divided into four main functional areas: storage area, used for storage of goods, mainly high-level shelves; conveying area, conveying in this area the system is responsible for sending the picked goods to the sorting area or the incoming goods. The area is sent to the storage area; the sorting area is responsible for sorting the goods sent by the conveyor system according to the requirements; the out/in storage area is responsible for the outbound and inbound storage of the goods. In some cases, the sorting area can be merged with the outbound storage area.

3 Experiments

3.1 Experimental system knowledge base

The object of this experiment is the modern logistics management system of artificial intelligence adopted by an enterprise. The biggest highlight of the experiment management system in this paper is the establishment of an automated three-dimensional warehouse. The warehouse has a unique knowledge base in the scheduling expert system, which is based on Built by the experience of three-dimensional warehouse scheduling experts. By summarising the scheduling experience of experts, some basic principles of scheduling are obtained. The knowledge in the knowledge base is established on the basis of these principles. After summarising, the scheduling rules of the automated three-dimensional warehouse mainly include two aspects: one is job task scheduling (time management), and the other is that the goods entering and leaving the warehouse should conform to the principle of cargo space scheduling (space management). Job scheduling principles (task sequencing) Job tasks are the main content of an automated three-dimensional warehouse scheduling system. Job scheduling is mainly to arrange the order of task execution according to the characteristics of the goods, and to reasonably schedule the stacker to complete the job task. In order to achieve reasonable scheduling, on the one hand, it needs reasonable data and information as the basis, on the other hand, it must have reasonable scheduling principles and algorithms.

The establishment of the knowledge base of the automated logistics management system directly affects the speed and efficiency of the inference mechanism. The production knowledge base of automated three-dimensional warehouse dispatching expert system is established using production rule representation (also called rule representation). The basic form of production rules is: *P*–*Q* or IF–*P*–THEN–*Q*. Its meaning is: if premise *P* is met, conclusion *Q* can be derived or the operation specified by *Q* can be performed. According to the above forms and principles, establish a knowledge base of an automated three-dimensional warehouse scheduling expert system. Some rules in the knowledge base are expressed as follows:

(Where *R* stands for rule)

R1: Worker *F* stacker busy THNE starker status is set to ELES stacker status is set to 0;

R2: The state of the stacker of worker *F* is 0THNE and the order is issued for the stacker;

R3: The position of worker *F* is already in stock. The position of freight is set to F;

ELES position status is set to E;

R4: The status of worker *F* is ETHNE and can be put into the warehouse for delivery;

R5: FI warehousing HTNE looks for empty cargo positions in the corresponding area from left to right, then from bottom to top, from outside to inland;

R6: FI outbound THNE to get the area where the goods are located;

R7: 3FI outbound quantity THEN outbound time TAX the longest time in the area where the goods are located *x* safety factor *x* outbound quantity.

3.2 Experimental model establishment

After obtaining the logistics service information, the important work is to reasonably arrange the logistics progress from the information, and then control the logistics cost and ensure the efficiency of the logistics and complete the logistics tasks in a timely manner. In actual work, some work information is often not updated in time, and some messages are not transparent enough. Therefore, it is a very complicated problem to collect the correct service information in a timely manner and evaluate the most needed areas. The relationship between logistics information and completion time is a schedule model. The reasonable arrangement and distribution of progress is the key to determine the pros and cons of logistics management. Therefore, in the research of modern logistics system, the progress arrangement model is mainly established. The purpose of establishing a progress arrangement model is to establish a functional relationship between logistics information and logistics work, that is, to use the information obtained from various channels to determine the impact of various factors on logistics progress, and to establish a function model that reflects the progress arrangement. After getting all kinds of logistics information, you can reasonably allocate and arrange the logistics progress according to the current working resources.

Commonly used methods for establishing statistical models include stepwise regression, multiple regression, weighted regression, and so on. There are many factors that influence the progress of logistics. In addition, the built GM model was used to predict the information in the future. Artificial intelligence-based modern logistics systems belong to the emerging industry. Statistics on the quantitative data of the modern logistics system market size at home and abroad have only begun in recent years. The data used to forecast the future market application of modern logistics systems is also very small. The paper uses the grey prediction model to predict the development of artificial intelligence technology in modern logistics systems. The forecast of intelligent logistics management from the side, Under the premise of qualitative research on intelligent logistics, further enrich the quantitative research theory.

In addition, when establishing a logistics information collection model, it is necessary to determine the relevant collection indicators. After establishing a statistical model, the collection indicators can be determined. From the knowledge of mathematical statistics, it can be known that when the statistical model established based on the least square method satisfies the conditions of Gaussian assumption and the normal distribution of residuals, the obtained statistical model is the best unbiased estimation. This model can be used for overall estimation and prediction. Under normal circumstances, there is no abnormality in the residual sequence obtained after the observations are fitted; if there are abnormal values, it may indicate a precursor of instability. The upper and lower limits for judging whether the collected information value is abnormal are called collection indexes. There are two common methods for establishing collection indicators based on statistical models: confidence interval method and small probability method.

3.3 Experimental fault tolerance mechanism

Since the development of artificial intelligence technology is not yet mature, the modern logistics management system experimented in this paper specially established a fault tolerance mechanism, which established hardware fault tolerance and software fault tolerance. The equipment redundancy scheme is adopted on the system hardware. Three interlocking dispatch computers are placed in the department's dispatching center, one is responsible for dispatching the iron-making regional stations, one is responsible for dispatching the regional station, and one is the standby machine. The software running on the computer in charge of the station dispatching in the work area is the same as the software running on the interlocking computer in the iron-making area, and the software running on the computer in charge of the grouping station dispatching is the same as the software running on the interlocking computer in the grouping area. When a computer is in standby state, when the main interlock computer fails, the interlock operation is manually switched by the operator to the standby machine through the shared device. The information channels for the shared device switching include keyboard and mouse input, communication bus, and display output. Wait. When switching from the interlocking host control to the interlocking backup machine control, the interlocking backup machine will re-establish the communication link with the PLC, and then the system initialisation setting work, the entire switching process takes 10–15 s. After the switch-over, the original interlocked host is downgraded to an interlocked standby machine, and the original interlocked standby machine is upgraded to an interlocked host. At the same time, software such as interlock scheduling and vehicle number entry will also automatically switch to the communication connection with the current interlock host.

The hardware fault-tolerance mechanism server and other information used in this experiment are shown in Table 1.

Table 1 Hardware fault tolerant server

Server type	*Service object*	*Function*
HPLH3000	200	Inter changer
Spanning–Tree	200	Access server
100BASE–T	300	Access server

The database server of the logistics of the integrated automation management system is set in the Ministry of Transport, and the clients of the logistics management system are in the marshal-ling station and the workstation, respectively. The client and the database server are connected through a local area network. Under normal network conditions, the system operates normally. Despite the redundancy in the network hardware, there may still be situations where the network is disconnected or disconnected. When the network is disconnected, how can we ensure that the system can run normally. The following solutions were adopted. In addition to the installation of a central database in the departmental adjustment center, they also installed their regional database servers on the client machines of the logistics management system of the marshaling station and the iron-making station, respectively. Under normal network conditions, the client connects to the central server, and then uses the SQLSEVRER database distribution method to ensure that the data in the regional database and the central database are consistent. There are four distribution methods: snapshot replication, transaction replication, merge replication and distributed replication. The type merge replication used in this system. Merge replication can track changes to papers in all publications on the server, and then synchronise with these changes, so all copies of the database have exactly the same data. Because any server can modify the data, there are some solutions to conflicts. The standards based on these solutions are determined by the management staff. "After all conflicts are resolved, these changes are passed back to the publishing server and then copied to all subscribers".

4 Discussion

4.1 Analysis of related parameters and functions of complete equipment of modern logistics system

In order to study the application of artificial intelligence technology in modern logistics system automation technology, a hybrid simulation control system for modern production logistics researched in this dissertation is based on a system consisting of four basic logistics equipment, using a management and monitoring computer integrated multiple PLC control Controller bus network control, AC frequency conversion speed regulation integrated automatic process control solution, which integrates cargo assembly, sorting, patronising, storage, extraction, distribution, and transportation in one. The first is an automatic sorting robot system with artificial intelligence technology. When the sensor detects the goods, the cylinder moves and pushes the container out, sliding it into the hole of the turntable along the chute. The lower cargo box detection sensor detects it, and then sorts the goods. The efficiency of this automatic sorting robot system in sporting goods is compared with the traditional manual sorting data, as shown in Table 2.

Table 2 The work efficiency under the integrated service system of social work information

Task load	*Traditional logistics system*	*Automatic sorting robot system*
Invoice amount	120000	200000
Sorting time	16 h	8.5 h
The sorting efficiency	0.21	0.86
The sorting cost	6000	1500

The data in Table 2 reflects the superiority of the automatic sorting robot system in handling the logistics distribution. It can be seen that with this automatic sorting robot system, the sorting order processing volume, sorting efficiency, and sorting cost are all more traditional than Great improvement, work efficiency increased by about 50%.

The automation technology of modern production logistics system is not only reflected in the automatic sorting of goods, but also the automatic pallet system of materials. Automatic material pallet system makes full use of artificial intelligence technology. The basic working principle of the material automatic pallet system: the goods output by the output belt conveyor of the material buffer storage system unit first enter the parallel belt of the belt conveyor of the automatic pallet system unit, so that the goods enter the cargo conveying mechanism to reach After a certain number of cargoes, the push plate action of the cargo advancement mechanism causes the cargo to enter the loading platform of the cargo lifting mechanism, and it is accurately placed on the cargo pallet by the cargo transport mechanism, and the pallet is sent to the roller chain of the pallet transport mechanism, Drive the pallet to send it to the pallet working area of the cargo lifting mechanism, and then realise the transfer of cargo. The efficiency of this automatic material pallet system in transporting goods is compared with traditional manual data, as shown in Figure 1.

From the data in Figure 1, it can be seen that the quality of the automatic material pallet system of modern logistics systems is very high, and its material transmission efficiency is very high, which can basically achieve timely delivery and transmission. Under the influence of this automatic material pallet system, the efficiency and accuracy of cargo pallet in the logistics link have been improved, and the work efficiency of cargo pallet in the logistics link has been increased by 15% compared with the previous manual operation.

In the logistics link, the warehouse management of modern logistics systems also uses artificial intelligence technology to achieve automation. The automated working process is roughly as follows. First, the pallet conveying mechanism of the automatic pallet system unit outputs the cargo pallets and enters the loading platform of the automated warehouse system unit. The detection of the sensor makes the aisle starker move, and the cargo extraction mechanism makes the goods accurate. Enter the predetermined three-dimensional warehouse storage rack, and the goods can be taken out of the three-dimensional warehouse by the cargo picking mechanism of the roadway starker and placed in the loading platform, so that the goods are extracted and entered into the next system unit. The efficiency of this automated three-dimensional warehouse system in cargo management is compared with traditional warehouse management data, as shown in Figure 2.

Figure 1 Working efficiency of material automatic pallet system (see online version for colours)

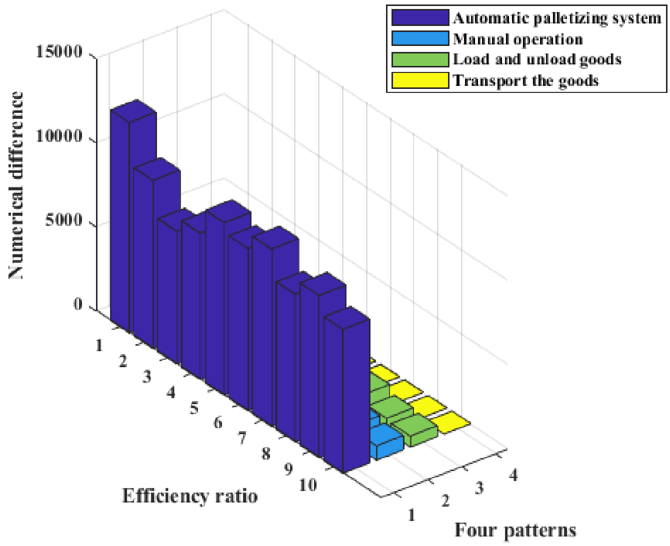
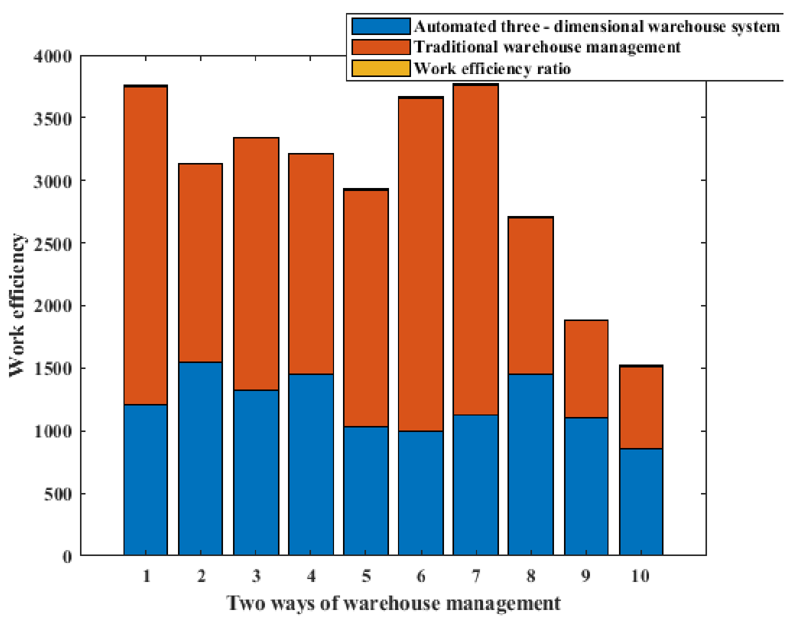


Figure 2 The advantages of automated three-dimensional warehouse system (see online version for colours)



As can be seen from the data in Figure 2, the superiority of the automated three-dimensional warehouse system created under artificial intelligence technology has a high level of automation and high reliability. Basically, it can fully realise the material storage, warehousing, and warehousing, and greatly reduces the use of human resources. It can effectively reduce related working time by 60% and increase work efficiency by 25%.

4.2 *Analysis of the development prospects of artificial intelligence in modern logistics systems*

The application of artificial intelligence technology has involved many fields in people's lives, and has made this contribution to the development of human beings in various industries around people. The application of artificial intelligence technology in five of these areas is the most extensive including: security, transportation, medical, power, and logistics. These several fields are closely related to people's lives and bring the greatest convenience to people. Through statistics on the market size of artificial intelligence technology in these fields, we can get the market size of each field. This can also be used to understand the feasibility of artificial intelligence technology using modern logistics system automation technology. The specific survey results are shown in Table 3.

Table 3 The scale of the artificial intelligence market in all sectors in 2017

Domain name	*Accounted for*	*A total of*
Intelligent security	52.6	
Smart power	13.7	
Intelligent transportation	7.80	
		100
Intelligent logistics	3.40	
Intelligent medical	2.60	
Smart social work service	1.8	
Other	18.1	

As can be seen from Table 3, at present, artificial intelligence technology is mainly applied to intelligent security, and logistics accounts for 3.4% of the market. The market size is relatively small, but it shows that it has a market and its market share is increasing year after year. It can be seen that the application of artificial intelligence technology to modern logistics systems is completely feasible, but the applied automation technology and depth are worth exploring. Therefore, based on the statistics of the development scale of the application of statistical artificial intelligence technology in the modern logistics system of automation technology, the forecast, survey and prediction results of the development scale of the precision services of intelligent social work are shown in Figure 3.

As can be seen from Figure 3, according to the statistical results and the grey model, the investment in artificial intelligence technology in various industries has been increasing in recent years, and the market share and investment in social work industries have continued to increase. The investment in artificial intelligence will reach hundreds of billions, and the relevant growth rate will maintain a 12% annual growth rate. With the input of large funds, the future logistics industry will definitely adopt artificial intelligence technology. By then, facing the increasing demand, modern logistics systems will be able to cope with it easily.

Figure 3 Development scale of intelligent logistics system (see online version for colours)

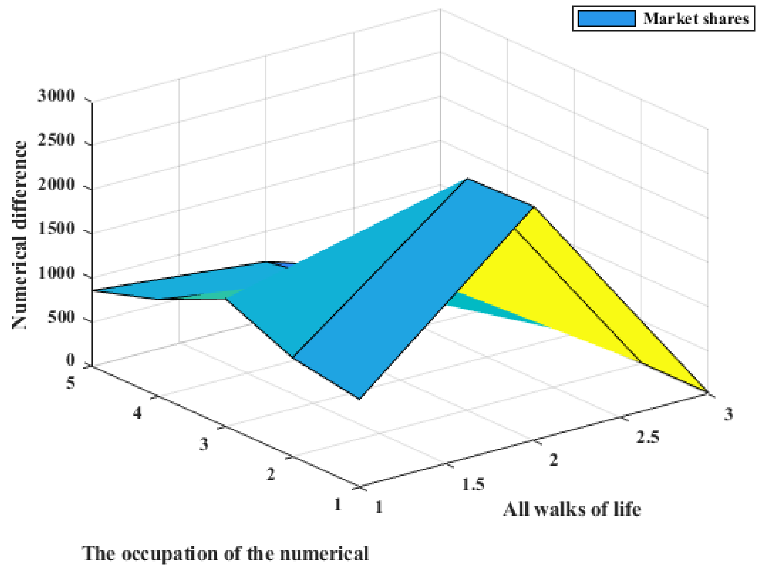
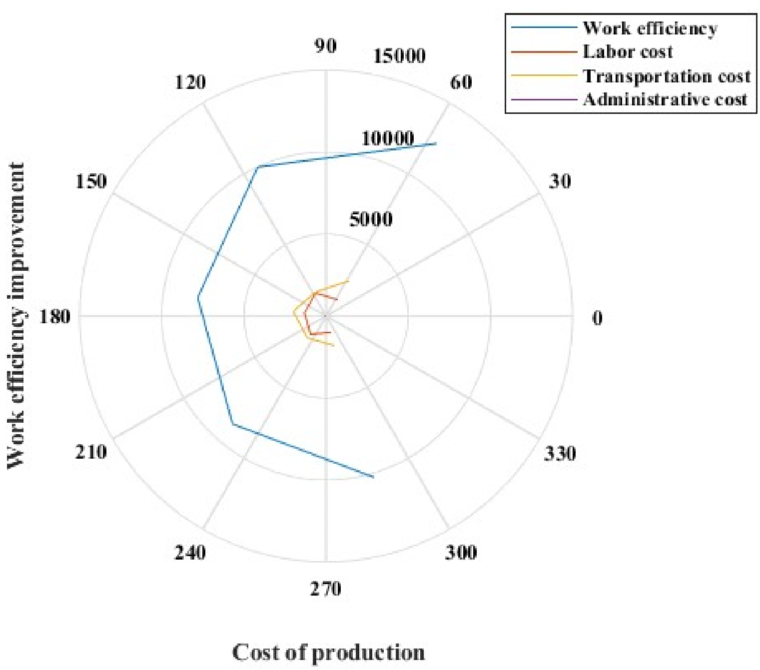


Figure 4 Analysis of statistical experimental results (see online version for colours)



This paper studies the specific performance of this modern production logistics in the production management of the enterprise, and checks the relevant data. This can further verify the reliability and accuracy of the system and the feasibility and excellence of artificial intelligence technology in the application of automation technology in modern logistics systems. Statistics forgotten a large number of production data and experimental results. After statistical analysis, the results are shown in Figure 4.

It can be seen from Figure 4 that after experimental testing, the expected effect of the modern production logistics system based on artificial intelligence technology has basically reached the standard. Among them, the work efficiency is increased by 25%, and the number of goods that can be sorted reaches 200,000 per day. The labour cost is greatly reduced, and the total logistics cost is reduced by approximately 31%. It can be seen that the application of artificial intelligence technology to modern logistics systems is completely feasible and necessary.

5 Conclusions

1 This paper analyses the common problems existing in traditional logistics systems, discusses these problems without solving them, and proposes corresponding solutions. Introduced artificial intelligence technology, and researched a modern production logistics system combining artificial intelligence technology and logistics system, and analysed the application components of this modern production logistics system using artificial intelligence technology to achieve automation.

2 Research on the application and development prospects of artificial intelligence technology in modern logistics system automation, and put forward corresponding technical and theoretical guidance, confirming the feasibility and excellence of artificial intelligence technology in modern logistics system automation technology application. From a quantitative perspective, the future investment in artificial intelligence will reach hundreds of billions, and the relevant growth rate will maintain a 12% annual growth rate. With the input of large funds, the future logistics industry will definitely adopt artificial intelligence technology. By then, facing the increasing demand, modern logistics systems will be able to cope with it easily.

3 The feasibility and superiority of modern logistics systems based on artificial intelligence technology are discussed and verified. Experiments have shown that the use of modern logistics systems improves the efficiency of traditional logistics systems by 25% and reduces logistics costs by 31%. The expected effect of the modern production logistics system based on artificial intelligence technology has basically reached the standard. Among them, the work efficiency is increased by 25%, and the number of goods that can be sorted reaches 200,000 per day. The labour cost is greatly reduced, and the total logistics cost is reduced by approximately 31%. It can be seen that the application of artificial intelligence technology to modern logistics systems is completely feasible and necessary.

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