Green Intelligent Logistics Sorting System in Big Data Environment

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Abstract. By referring to the current sorting process of logistics sorting equipment, combined with emerging technologies, green concepts and big data statistics, it is possible to predict the trend of future sorting systems and integrate existing technologies. First, investigate and research existing logistics warehousing. Next, the intelligence and automation of existing intelligent sorting are investigated. After investigating, on the basis of the above, this study analyzes the trend of the future sorting system and combines with the concept of green logistics. It optimized classification under principles of green warehousing conceptual to make the classification more efficient, more space-saving and more convenient; it uses the big data statistics technology to collect logistics information, provides information to the logistics company to re-plan the sorting point, and feedback to the electronic merchants to obtain the location of different kinds of online shopping products in each region, and make it possible to purchase goods in a targeted manner.

1. Introduction
With the rapid development of e-commerce, the scale of network shopping has also shown a spurt type growth. The rapid development of Internet technology is accompanied by the popularization of smart mobile devices in various regions, which together promote the vigorous expansion of e-commerce worldwide. At the same time, the scale of network shopping continues to expand, and the contribution of logistics economy to China and even the world economy also increases year by year [1]. As can be seen from the above, with the rapid development of logistics industry, the industry competition is increasingly fierce. Logistics efficiency has become an important factor for consumers to choose logistics companies, and it is also the core competitiveness of logistics companies [2]. The sorting of goods is the link of the whole logistics with strong variability and easy integration with advanced science and technology and various disciplines. What is most worth thinking about is how to combine artificial intelligence with traditional sorting to create a logistics system that is more efficient, more economical and more environmentally friendly.

2. The Status Quo of Logistics Sorting
In the whole link of the supply chain, logistics plays a crucial role in it. The sorting system studied in this paper is the core part of the logistics warehousing center, which has attracted more and more attention from the public. Whether the allocation of cargo space is reasonable or not will affect the efficiency of the overall warehousing operation of the logistics storage center, and thus affect the rate of enterprises' profit acquisition [3]. Logistics intelligent sorting machine is a flexible transportation unit in the postal hub system, the working principle is to accept the master computer tasks, automatic handling mail sorting standards, and make the results and data back to the main control computer of the
machine so that storage, query and printing are available in computer system, reducing errors and improving efficiency. The characteristics of intelligent postal equipment system are accurate, reliable and stable operation [4].

The above data analysis shows that the four elements of warehousing classification, intelligent distribution, green logistics and big data, which can be combined by the intelligent sorting system.

The commonly used automatic sorting equipment includes: belt sorting machine, pallet sorting machine, surface sorting machine, horizontal moving roller table sorting machine, push block sorting machine and rocker sorting machine. However, the above sorting equipments can only sort goods of the same category or a few less varieties. They can only identify product varieties, but cannot identify customer orders. Therefore, they cannot quickly and intelligently sort goods of different varieties according to customer orders. Data cannot be extracted to quickly and intelligently respond to the sorting needs of different customers [5].

Intelligent sorting is to use the sorting system to sort the express according to certain rules and deliver them to a specific location, so as to achieve the effect of efficiency, speed and space saving. Some main results are: Martin Christopher embed RF technology (RF III) sorting system, to build a mathematical model to find the optimal model, make the automatic sorting system more efficient, intelligent [6]. According to Daria Battini et al., sorting operations cost a lot of man-power and time in logistics activities to find out the optimal sorting strategy, reasonably allocate storage location and reduce the walking path of sorting process. Tricia Hyland, who has established ring sorting model first, designed the express distribution information control system. Ulrich Beck studied the tracking technology of express area, optimized and updated the feeder subsystem in the automatic sorting system with the mathematics of discrete parallel system, analyzed the upper process of static model and dynamic model in the stack-block sorting system respectively, optimized the feeder machine in the stack-block sorting system, and improved its feeder efficiency [7].

Now, the sorting devices formally applied in the factory is Caocao robot independently developed by Ali in Tmall supermarket. The robot can quickly locate the distribution of goods in the warehouse and plan the optimal picking path. After picking the goods, it will automatically send them to the packing desk such as Fig. 1. Another sorting robot, called minions, is being used by logistics companies such as EMS, JD and STO. It has a built-in intelligent identification system, which can recognize the information on the express side of the package, and then find the best way to stop delivery in the previously set route such as Fig.2.

3. Green logistics and logistics big data
Different scholars and organizations have given different definitions of green logistics according to their different understandings. For example, H.J.Wu and S.Dunn (1995) believe that green logistics is a
logistics system responsible for the environment. The United States reverse logistics executive committee (RLEC) considers green logistics as the logistics process with minimal impact on the ecological environment. Compared with traditional logistics, green logistics pays more attention to protecting the ecological environment. Green logistics refers to the scientific development concept of logistics based on the general principles of economics, sustainable development theory, ecological economics theory, ecological ethics theory, internalization theory of external cost and logistics performance evaluation. Green logistics uses advanced logistics technology to plan and implement logistics activities of transportation, warehousing, handling, circulation processing, packaging, distribution and other operational processes. The connotation of green logistics includes the following five aspects: intensive resources, green transportation, green storage, green packaging and waste material logistics. How to integrate information to realize green logistics, this time should use big data thinking to realize the optimization of logistics sorting.

The so-called big data of logistics refers to the data and information involved in the logistics links such as transportation, warehousing, handling, packaging, circulation and processing. At present, the scale of global online shopping has reached an unprecedented huge level, which also brings great pressure to logistics, and the demand for information on each node is also increasing. Through big data analysis, transportation and distribution efficiency can be improved, logistics costs can be reduced, and customer service requirements can be met more effectively. Nowadays, big data has penetrated into all links of logistics and become the cornerstone of innovation in the logistics industry. In the future, the logistics industry's demand for big data will have a broader prospect. The industry reform and cross-boundary integration of big data, including supply chain, is under way. The classic definition of "big data" can be summarized into four V's: volume of data, Rapid data flow and velocity, Variety, Huge data value.

Where can the information and data collected in the logistics process be used? Intelligent distribution of logistics outlets, optimization of transportation routes, improvement of loading rate, optimization of the last kilometer, decision-making at the company level, intelligent recommendation of deliverers, etc. From point to surface, gradually improve the level of intelligence and intelligent logistics will show its incomparable advantages in terms of efficiency, cost and user experience.

4. Green logistics is combined with big data in the sorting process

The first step is to judge the effective information under the guidance of green logistics rules, and then accurately and timely restore the business through big data technology, that is, to collect the data in the logistics sorting process in a timely and accurate manner and present it according to different levels of requirements. For the logistics system, it is very important to have a graphical display, usually a picture is worth a thousand words. In the time dimension, the production capacity of each node and the difference between adjacent nodes can be displayed in real time, which can well control the business. In the process of sorting, the flow of goods per unit time, regional statistics, commodity statistics, volume classification of goods per unit time, as well as the delayed stock of goods exported by the sorting machine all need to be restored in a timely and accurate manner and displayed separately at different levels of demand. Logistics is the combination of commodity flow, material flow, capital flow and information flow. Therefore, it is very important to display information in different dimensions.

The second step is to evaluate the logistics information extracted from the periodic sorting of the unit through big data. In the era of big data, we can conduct business evaluation based on socialized data, and make use of the Internet gray scale test method to conduct process optimization evaluation. These methods can be fed back to logistics sorting to optimize its rules so as to conduct more reasonable sorting. For such labor-intensive industries as logistics, the use of real-time data into the industry ranking can also play a good role in stimulating the scene.

The third step is to use big data to predict logistics after real-time monitoring and accurate evaluation of cargo information. Prediction has always been the core of big data applications, but also the most valuable place. Accuracy of prediction, also known as confidence in traditional statistics, is an important measure of prediction. Big data predictions, many of which make use of correlation, are easier
to predict if the application is more tolerant of accuracy. For the logistics industry, it is very meaningful to predict the business volume in advance for resource scheduling, which can not only realize better timeliness, but also meet the requirements of green logistics to avoid waste. For example, in a certain period of time, the logistics sorting points will be fed back to the forecast of big data to realize the manpower and material resources scheduling of warehousing sorting.

The fourth step is to make intelligent decisions based on big data. Largely depend on the business for the accuracy of the prediction accuracy and comprehensiveness, it can be concluded that the four quadrant, for business high prediction accuracy and comprehensiveness, the more likely it is to realize intelligent decision, the best way is still the man-machine combination, using big data and artificial intelligence technology to provide artificial auxiliary decision-making and letting human decision-making more reasonable. For example, according to the delivery location planning of logistics storage location and scope to intensive resources, according to receive location information to route planning which conforms to the green transportation, information planning different depending on the type of goods storage space so as to conform to the green storage, according to the volume of information and commodity type to scientifically design the packaging which conforms to the green packaging, according to the quantity of the goods and the size of the organization to focus on waste material logistics.

5. Conclusion
To sum up, the wisdom logistics sorting is based on large data processing technology. It combines equipment to better use software system which is guided by the principles of green logistics and improves system intelligent level to let people and equipment can play their respective advantages to reach the best state of the system and evolves constantly. Logistics intelligent sorting, as a new social infrastructure, optimizes the classification rules with the concept of green storage, making it more efficient, more space-saving and more convenient. It collect logistics information by using big data statistics technology and give feedback to logistics companies to facilitate the re-planning of sorting points, then give feed-back to electronic merchants to obtain the distribution of online shopping items in various regions so that they can purchase and sell goods in a targeted way, so as to optimize the supply chain further. Therefore, the development of intelligent logistics has broad prospects.

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