Management Innovations Research of the Logistics Enterprises Based on the Big Data Environment

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Abstract: In the operation of logistics enterprises, both internal management and external operation will produce a lot of data. It can be effectively used as the information assets of enterprises and the guidance for enterprise management optimization, cost control, efficiency enhancement, risk identification and avoidance, which is of great significance to the future of enterprises. Big data with its advantages is different from traditional data processing. It can be combined with management innovation of logistics enterprises to effectively optimize the allocation of logistics enterprises resources. The paper mainly explores the direction of the combination of big data and logistics enterprise management and innovative measures.

1. Introduction
With the development of information technology, smart logistics, 5G and network infrastructure, the development of e-commerce, express logistics, instant communication and cloud computing is accelerating, which makes the logistics industry closely linked with e-commerce and promotes the prosperity of the logistics industry and brings greater management pressure. How to change pressure into motivation? Logistics enterprises can use big data, which is different from the traditional. It is more complex with more information and stronger correlation. It can process more quickly and optimize the innovation management, ensure the service quality, reduce the operational risk, thus promoting with high quality.

To break through the bottleneck of logistics enterprise management by using big data, it is necessary to find the combination point of innovation between big data and logistics enterprise management.

2. Direction of integrating big data with management innovation of logistics enterprises

2.1 Build a logistics and transportation information sharing platform
Transportation is the main source of “the third profit source”. Under the background of big data, logistics enterprises internal management and external operation will produce large amounts of information. In order to facilitate business operations, it should attach importance to railway, road and sea transport, air transport, inter-provincial transport, and cross-border transport information integration. It should establish transportation information sharing platform, help logistics enterprises transport information in time, realize effective connection and transport of goods, avoid the risk of transportation, optimization of transport routes, arrangement of logistics center. It can better enhance logistics enterprises operation efficiency.
2.2 Management of transportation tools and express parcels
The management of transportation tools and express parcels can be strengthened in terms of scheduling and maintenance. Combining GPS, GIS and transportation, it can optimize vehicles, ships, trains, planes of rotation or lease frequency, reduce the vacancy rate, improve cargo transport, position the vehicles and other tools. It can help to estimate arrival time, get ready early and immediately dispatch rescue teams as much as possible to the logistics after accidents. From the perspective of the positioning of the express parcels, the location of the parcel can be displayed to the customer in a timely manner. In the case of lost or missing, it can also be identified, recorded and held accountable and express apologies and make compensation[1].

2.3 Risk identification and avoidance
Big data technology can analyze, integrate, and execute risk identification and avoidance programs. The scale and coverage of logistics enterprises are generally large, which leads to large risks and hidden dangers in the operation. Relying on big data technology, logistics enterprises can effectively identify and avoid hidden dangers in equipment, system and service.

2.4 The effective use of big data analysis companies
The demand of big data for personnel, equipment, technology is higher. Comprehensive data collection, integration, information platform frame can produce larger costs. Logistics enterprises with big data technology innovation management can invite the third party in the application with less costs and higher quality.

2.5 Enterprises culture shaping
Enterprises culture can enhance the centripetal force and cohesion. Under the background of big data, logistics enterprises need to form the consciousness of information management, details management, standardized management, and promote the innovation of enterprise culture, shape the “craftmen spirit”. It also needs to do well in data recording, reporting and integration, ensure true and reliable data and promote information sharing to maximize the big data technology application.

3. Measures to combine big data with management innovation of logistics enterprises

3.1 Innovative management measures based on logistics and transportation platform
When carrying out logistics and transportation business, enterprises should collect and integrate relevant information in logistics and transportation activities, and build a logistics and transportation platform. Generally speaking, the logistics and transportation need to consider road condition, transportation route, transportation tools location, parcel timeliness, international political environment, international logistics chain, etc.,. In the construction of logistics and transportation platform, information collection, processing and resource allocation should be taken as reference. When constructing a logistics transportation platform, logistics and transportation companies should establish internal information interconnection channels to effectively link various warehousing and logistics centers, management organizations at various levels and businesses. Enterprises should also strengthen cooperation and share regional information with other small and medium-sized logistics companies, large logistics companies, e-commerce customers, railway transportation companies or institutions, shipping companies or institutions, air transportation companies or institutions, map companies or national satellite remote sensing application centers, etc. From the perspective of information processing, it is also necessary to pay attention to the integration and processing of big data. When building a logistics and transportation platform, enterprises should establish a targeted data analysis system to ensure the efficiency and quality in analysis software, processing teams and publishing servers. From the perspective of resource allocation, the logistics and transportation platform should be organically linked with all levels of organizations, warehouses and logistics centers, and employees in various positions. Relying on the data processing results, express logistics
transportation routes, departure times. Upgrading maintenance programs for transportation vehicles, additional storage and logistics centers to rationally use the results to optimize the operation efficiency of logistics enterprises[2].

For example, companies tracking government policies, as shown in table 1 can prepare for development opportunities. When enterprises share information on local logistics chains, distribution points, road conditions, logistics business volume and other information with other logistics companies, they can weigh the cost and benefits of branch construction. If the area is more remote, they can share the same warehouse distribution with other companies. To save the cost of branches and logistics chains, branches locally can improve the scope of service and release immediately after adding the documents of the organization. The local office staff can begin to select a site and recruit them to improve efficiency.

Table 1. Some policies issued by the government in recent three years are conducive to the logistics industry

| Year             | Policies                                                                 | Main content                                                                                                                                 |
|------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 18th April 2018  | “Notice on Conducting Pilot of Supply Chain Innovation and Application” | The main tasks of the pilot cities are to introduce policy measures to support the innovation of the supply chain, optimize public services, promote the industrial supply chain system, and explore new models of supply chain governance across sectors and regions. |
| 9th Oct 2018     | “Three-year Action Plan for Promoting the Adjustment of Transport Structure (2018-2020)” | By 2020, the national cargo transportation will be significantly optimized, the volume of bulk cargo transportation undertaken by railways and waterways will increase significantly, and the volume of harbour and rail transportation and container multimodal will increase significantly. Jinji and its surrounding areas have been built into a national demonstration zone. |
| 21st December 2018 | “Layout and Construction Planning of National Logistics Hub” | Combined with the “ten vertical and horizontal” transportation channels and the basic pattern of domestic logistics. 127 cities with certain basic conditions were selected as the national logistics hub bearing cities, and 212 national logistics hubs were planned and constructed. |
| 16th May 2019    | “Deepening the Reform of the Toll Road System and Eliminating the Implementation Plan of Provincial Stations on Expressways” | Deepen the reform of the toll road system, improve the comprehensive transportation network, and reduce logistics costs. Within two years, the toll stations of provincial highways across the country will be basically eliminated to achieve fast toll collection without stopping. |
| 30th October 2019| “Opinions on Deepening the Reform of Road Transport Prices” | Deepen the market-oriented reform of transportation prices and promote the high-quality of the industry. |
| 6th March 2020   | “Notice of the Development and Reform Commission of the Ministry of Transport on Phased Reduction of Port Charge Standards and Other Matters” | Measures such as gradually reducing government service charges for port operations, reducing the logistics costs of cargo owners and shipping companies, promoting the optimization of the port business, and the coordinated resumption of production. |

3.2 Innovative management measures based on transportation tools and express parcels

In the context of big data, tools and express parcel management should pay attention to location positioning, information comparison of express logistics parts, transportation plan, and maintenance plan for transportation tools. From the point of location positioning, as shown in figure 1, the
positioning of the transportation tools can lock the position and the shipping position in time, or dispatch a rescue team after the failure of the transportation tools to ensure the timeliness of the logistics. From the comparison of express logistics, big data can establish cycle management from receiving and labeling to deliver to customers and form a complete management chain, which can update the shipping location on each logistics node. Enterprises can evaluate the risk of lost items without renewing the shipping for a long time, and urge the warehouse management personnel of the relevant nodes to find out to avoid the lost items. From the perspective of transportation tools, it can rely on big data to track the location and arrival time, and then the subordinate stations can determine the dispatch time and frequency of the station according to the concentrated amount of goods to reduce the vacancy rate and the cost. From the view of transportation tools maintenance plan, assessment of failure cause and fault can change partners, optimize transit routes and quick replacement parts for provision of the basis[3].

For example, a locator can be installed to upload location in real time, and the system can estimate the arrival time according to road conditions, distance, speed and other factors. After the vehicle sends out a distress signal, the trailer company can be arranged, or the rescue vehicle can be sent to replace the mail with a better role in service optimization. Paying attention to the setting of travel plans can reduce the number of trips, reduce the vacancy rate of vehicles, and save transport costs when the arrival quantity is small. If the big data analysis shows that most of the vehicle faults are flat tires, the driver can be required to have spare tires and tools to ensure the timeliness of the delivery.

![Figure 1. Location information positioning of logistics vehicles](image)

### 3.3 Innovative management measures based on risk identification and avoidance

Risk identification and avoidance refers to the timely disclosure of potential risks based on big data analysis, and the formulation of risk avoidance schemes strictly restrict or adjust the operation of logistics enterprises. From the point of risk identification, big data should be used in the management system, business, infrastructure, talent, service quality, cost, market competition and development on the omni-directional and multi-level analysis. Under the big data technology, it can build enterprise model, understand the disadvantages that exist. From the perspective of risk avoidance, it is necessary to rely on risk identification to understand the problems existing in the operation of logistics enterprises, so as to serve as the basis for the enterprises and urge the middle and senior management, grass-roots and front-line operators to earnestly implement the improvement.

For example, the logistics enterprises can timely find the insufficient manpower, weigh the
business and strengthen recruitment, grass-roots management personnel to strengthen the management and curb the brain drain, the financial sector assessment and staff salary and post contribution with a bonus incentive. In the context of big data, the linkage between different departments of logistics enterprises can better deal with the unbalanced manpower and business volume.

3.4 Innovative management measures based on big data analysis companies

Big data analysis companies are professional. Logistics companies can outsource the big data analysis to a third party due to their lack of experience. How to choose a third party big data analysis company? It can start from production qualification, market credit, confidential data protection and so on. From the point of production qualification and the market credit, logistics enterprises in the choice of specialized companies can advance the qualification of the third party company to carry on the analysis to determine whether a company’s business ability can meet the demand of enterprises, then evaluate the third party company market credit, through the data feedback of other enterprises. From the perspective of confidential data protection, an enterprise should sign an information confidentiality agreement with a big data analysis company, requiring the company not to disclose the internal operation of the enterprise at will, and the enterprise should also pay attention to the confidential data.

For example, when an enterprise outsourcing big data application project, it pays attention to the market credit of the third-party company, so that it can evaluate the credibility of the third-party company from its previous success or failure cases and market violation records. When negotiating for cooperation, the third party company may be required to keep confidential the internal information of the enterprise to prevent the third party company from reselling the enterprise.

3.5 Innovative management measures based on corporate culture shaping

Through large data, the analysis of the various information in business operation help to grasp condition, reasonable planning, transport, storage center and its branches responsibility. Grass-roots management personnel and operators can comply with the requirements of the enterprise, send a transfer and guarantee the efficiency of the distribution and report to the hidden trouble.

For example, pay attention to the infiltration of information management awareness. the middle and senior management can be a comprehensive collection of enterprise operation state, and timely spot check the front-line operators. Operators can fully understand the state, identify security risks in a timely manner. Front-line operators have the awareness of management, so they can report lost or damaged parts. Timely feedback from the system to customers facilitates the understanding of customers and ensure the quality of shipping services.

4. Conclusion

Under the background of big data, logistics companies can innovate and develop ways from logistics and transportation information platforms, transportation tools and package management, risk identification and avoidance, big data analysis companies, and corporate culture. At the same time, focusing on the application quality of each way can better optimize the operation and improve the quality of logistics enterprises.

References

[1] Yan Youliang. 2016. Research of logistics enterprises management innovation based on big data [J]. Logistics Engineering and Management, (12).
[2] Gao Xiaochen. 2018. Analysis of logistics enterprises management innovation based on big data [J]. China Business Review, 000(020): P.16-17.
[3] Deng Jinlei. 2019. Analysis of logistics enterprises management innovation based on big data [J]. China Management Informationization, 022(004):75-76.