Application of Data Governance in Logistics Industry

Shuguang Chen[1], Zhifeng Mao[1*]

*Corresponding author: 1225778151@qq.com

Liuzhou City Vocational College Liuzhou, Guangxi, China[1]

ABSTRACT: The rapid development of big data in various industries has attracted the attention of the government. The requirements of strengthening big data governance capabilities and resource status are reflected in the 13 th Five-Year Plan. From warehousing to transportation, the logistics industry has established a large number of business and management systems. While meeting consumer demand, it has also accumulated massive data. However, data governance has not made essential progress for a long time, resulting in these data not supporting the management of enterprises. The main problems are unclear governance ideas, lack of governance systems, and poor data quality. In the future, logistics enterprises should grasp the general trend of the industry, improve the quality of service in an all-round way, and make improvements from the aspects of defining data governance strategy, constructing perfect data governance organization, perfecting data service processing process and ensuring data quality.

Keywords: Data Governance, Big data, Logistics Industry, Network Platform, Logistics Information

1. INTRODUCTION

The rapid development of big data in various industries has attracted the attention of the government. The requirements of strengthening big data governance capabilities and resource status are reflected in the 13 th Five-Year Plan. From warehousing to transportation, the logistics industry has established a large number of business and management systems. While meeting consumer demand, it has also accumulated massive data. However, data governance has not made essential progress for a long time, resulting in these data not supporting the management of enterprises. The data of enterprises are distributed in different systems, each system is an island, and its liquidity is not strong. The data of the enterprise as a whole has problems such as low quality and uncentralized responsibilities. Good data governance is a key factor to assist the logistics industry to strengthen its competitiveness. In order to transform the growing data into more valuable digital assets, and then become the strategic assets of enterprises, effective data governance is the only way [1]. Taking the logistics industry as the object, the research on the optimization strategy of its data governance work can provide reference for the development of related industries. The main purpose of studying this problem is as follows: drawing on relevant experience, expounding the governance methods of data governance; improve data management capabilities, help build a number of smart logistics companies, and provide a basis for the digital transformation of logistics companies.

2. ANALYSIS ON THE DILEMMA OF DATA GOVERNANCE IN LOGISTICS ENTERPRISES

2.1 Governance ideas are not clear

Consistent with the trend of consumption upgrading, the expectations of customers in the logistics industry are also increasing, and they hope to obtain more efficient and convenient logistics services at lower prices and more transparent processes. In order to improve the quality of service, some logistics enterprises are already carrying out data governance work, but their work ideas have not yet achieved breakthrough development. The so-called data governance is mostly carried out around the work and professional needs of various departments [2]. Many enterprises in the industry are still in the exploration stage of data governance and lack a clear management strategy. In many cases, this work is attached to the customer positioning work of the marketing department, and its analysis structure has not reached the level of supporting the company 's strategy. In the governance of enterprises, managers still follow their own experience and intuition, and still adopt sampling survey, pilot first and other means, which can not really consider the overall problem from the data basis of company development.

Most enterprises have not formed a unified standard for management data. The data comes from specific work. Each department will formulate data processing and implementation standards on its own, resulting in a wide variety of data received by management and different types, which seriously restricts the utilization efficiency. There is a lack of reliable data sources at the company level. When using cross-departmental data, it is necessary to check its authenticity, which affects the applicability of the data.

2.2 Lack of governance system

At present, most logistics enterprises are still in the stage of transformation and development, and the application of digital information technology is not enough [3]. Most logistics companies have not established a perfect data governance structure, and there is a lack of clear working system in terms of job responsibilities, specific processes, assessment systems, and security systems. Some logistics enterprises have exclusive information work departments. Each business department is the production unit of data. The management can see a large amount of data resources every day. However, due to the lack of specific data management objectives and systems, the overall data management organization construction is not clear, and the responsibility center has not been effectively implemented. In terms of data governance process, some enterprises have formulated comprehensive management rules, and initially identified the processing methods and guarantee systems of data governance. However, the relevant work has not received the attention of senior executives. The system construction cannot cover the whole process of data from access to application, and the construction of data sharing is even more lacking. In addition, some enterprises have great obstacles in data access. With the development of the logistics industry and the development of business, the requirements for data processing are getting higher and higher, and the requirements for the refinement of data are getting stronger and stronger. However, the access of some data requires the approval of multiple departments, and then disposed by the company 's information department. In the face of emergency needs, the difficulty of data access is more

obvious, and the data used needs the work of some classes such as business system, responsible department and background export.

2.3 Poor data quality

Data has become a special asset of enterprises, compared with physical capital and human capital, and its proper use has become a key factor to improve competitiveness and productivity in the future [4]. Under the background of the prevalence of big data concept, the logistics industry is also catching up, but some enterprises have the defects of emphasizing construction and neglecting application. The business data of the department has not been able to enter the company system accurately, and the system data can not fully reflect the company 's operating conditions, customer needs, market prospects and other key issues. After the enterprise system enters the business data, it lacks the necessary processing system, and there are problems in storage, processing, and application, which leads to a significant decline in the resource characteristics of the original data and cannot reflect the actual situation. In terms of data sharing and application, in general, a good situation of data-driven is forming, and there is a greater demand for efficient normalized data processing institutions to achieve the whole process management of data. In a word, high-quality data is a strategic resource for the operation of logistics enterprises. With the acceleration of its digital process, the ability to have sufficient data resources and a sound application mechanism will become an important link to widen the gap between companies. To make business data more valuable, enterprises must first ensure the reliability and high utilization of data sources. Efficient data governance helps to reduce the possibility of decision-making errors and the flexibility of corporate strategic choices. In the era of digital economy, the lack of clear goals, poor sharing, and imperfect institutionalization of logistics enterprises are comprehensive factors that cause data governance failures. The problem of data governance has the characteristics of arduousness and strategy. To improve this work, it cannot be accomplished overnight, nor can it be achieved immediately. Instead, it is necessary to infiltrate the idea of data governance reform in daily work to achieve leapfrog development of the logistics industry.

3.   LOGISTICS INDUSTRY DATA GOVERNANCE STRATEGY

3.1 Clear data governance strategy

From the perspective of resource allocation, customer behavior data is an important resource for the innovation model of logistics enterprises, and the logistics network platform provides important support for the use, evaluation and sharing of such data [5]. Logistics enterprises need to build an integrated operation and management platform to achieve a single, personalized high-quality logistics services, integrate supply chain relationships, and build a unified data processing and application standards within the industry. The data governance of logistics enterprises is a long-term project, which involves a wide range of business levels and requires the coordinated participation of multiple departments to change the decentralized and fuzzy governance mode in time. Enterprises must first build a clear data strategy to lay a solid foundation for the construction of intelligent logistics, so as to realize the sublimation of enterprise data governance. The data governance of enterprises should be highly coordinated with their development goals to enhance the flexibility of their adjustment. To improve enterprise data governance, the premise is to clarify the governance objectives, which is also a

key factor affecting the performance of data governance [6-8]. The data governance strategy formulation of logistics enterprises should focus on the company 's development strategy to ensure that the results of data governance facilitate the company 's business expansion. Based on the development status of the logistics industry, the company 's strategic objectives should be formulated around activating data value, expanding data sharing, realizing intelligent transformation, and supporting industrial development, so as to create data value, improve logistics management, and enhance people 's well-being. In good data governance, comprehensive data integration and sharing can be achieved, supporting the company 's refined management reform and improving the quality of customer service. Based on the overall perspective, enterprises should improve data governance, build a governance organization with clear division of labor, consistent power and responsibility, and detailed process, and comprehensively improve the level of data collection, management and application. The company must pay a certain cost to build a personalized data governance control platform, in order to achieve the whole process of data management as the core, the business data of various departments to conduct a comprehensive collection, continuous conversion, integration, integration of business data, classification management data, screening of common and personality data, the production of a sound data directory to ensure the use of data in the company 's management of flexible and consistent [9,10].

3.2 Build a perfect data governance organization

Efficient data governance requires work across multiple departments. Enterprises should build an internal governance organizational structure to undertake diversified work [11]. The data governance architecture can be divided into three layers : decision-making, management and execution. According to the specific situation of logistics enterprises, a vertical management framework of board of directors, information department and business department should be established to carry out normalized data management. Among them, the board of directors should take overall coordination work, control the general direction of data governance, determine the specific processes and standards of data governance, ensure the security of data governance, and be responsible for the coordination and scheduling of various departments when problems arise. The information department should be responsible for the formulation of specific work procedures, improve the governance path, planning programs, and specific measures. The board of directors should carefully review the work plan of the information department. Each business department is the producer and user of data. It is necessary to carry out supporting business according to the needs of data work to ensure that data governance has a stable foothold. The data center control platform is responsible for the implementation of specific work, carries out the whole process work according to the needs of data application, guarantees the data content, improves the management quality based on the technical perspective, and ensures the smooth operation of the platform. A perfect data management team should include the following work units :

The operation management unit is responsible for coordinating the implementation of major matters and process work ; the data demand unit is responsible for the data handover with the business department, and is responsible for the preparation and preliminary processing of basic data ; the data model unit is responsible for the traceability, modeling, maintenance and labeling of logistics information ; a high-quality service development team is responsible for determining the design of targeted services based on data analysis results ; the data resource

team is responsible for the integration of data results and the evaluation of application effects ; technical support unit, responsible for background construction, technical support and so on. In addition, data can only show its value in a certain scenario. When logistics enterprises organize data governance, a set of scenario data such as warehousing, transportation and customer service are fully considered, and the data fusion channel is opened to ensure the rapid improvement of logistics services.

3.3 Improve the data service processing flow

The process of data governance of logistics enterprises should grasp the two basic points of data and service, follow the principles of consistent responsibility, simple process, safety and efficiency, build a management system covering the whole cycle of data, and ensure the efficiency of data use. In addition, when dealing with some confidential data, the company must strictly follow the three-in-one system of approval, use, and reporting. The data can only be used after receiving confidential authorization, and it must be destroyed immediately after use to avoid consumer data. The company should also strengthen the information mechanism of data monitoring and integrate prevention and control of related events. The specific work steps are shown in Table 1 :

Table 1. Data service processing flow

procedure	job content	remarks
1	Demand integration link	The main work of this link is to integrate the data needs existing in the company 's business development, achieve rapid response, and continuously improve the quality of service, mainly including the formulation of programs, program design, and improvement of services.
2	Authorization application process	Business data is imported into the company database to achieve resource aggregation, including application and approval.
3	Data acquisition link	The source data access management process mainly includes access scheme design, audit, access and so on.
4	Data sharing link	Process cross-departmental data usage, respond quickly to data requests, and ensure the security and efficiency of shared data, including responding to requirements, formulating solutions, and sharing process processing.
5	Data processing	Quickly respond to data change requirements of business units, including application acceptance, program review, and data delivery.
6	quality control links	Ensure the data quality of the central control platform and promote source data governance, including quality verification, problem discovery, and problem governance.
7	Business data exit link	Strengthen the overall management of data services, and offline processing of data without business use, including application, audit, offline, confirmation and so on.

4. Ensure data quality

4.1 Develop data evaluation criteria

The traditional single dimension cannot fully evaluate the quality of data. In the formulation of multi-dimensional standards, the basic structure of logistics data should be taken into account, which can be decomposed into the following contents : First, whether there is a loss problem in the process of data transfer and delivery, if so, to what extent ; second, whether the collected data can reflect the basic situation of the whole business department. Use the expert method to organize the change rule of Guinan data of experts in various fields and evaluate its quality status. The advantage of the expert evaluation method is that it can combine the work characteristics of the business department to make a judgment of the New Year planning, and help the staff to make an intuitive understanding of their own business data.

4.2 Objective assessment of data.

The company should combine the quality standards of the data to achieve an objective assessment of the power data. When the results are excellent, the data can be used as the basis for the company 's operation. Paying attention to its changes can analyze the potential risks and opportunities in the work. When the final result is good, it shows that individual data has reliability problems. In view of this problem, it is necessary to improve data access rules and quality evaluation standards from a macro perspective. From the micro perspective, we should implement the responsibility center and track and solve the data problem according to the area where the problem occurs. When the evaluation results are poor, it indicates that there are problems in the data subject, and there may be problems in the source and selection of basic data, which need to be comprehensively rectified.

4.3 Data quality rectification

When some serious problems are found in some data, it is necessary to take the method of up and down linkage in time, give full play to the expertise of the information department and the business department, conduct a thorough investigation of the collected data, find out the areas where the problems occur, and focus on solving the irregularities such as inaction, inconsistency, incompleteness and unclearness, so as to ensure the reliability of the basis of data governance.

In view of the complexity of the logistics industry, the improvement of data quality should be a dynamic process to ensure the sustainability of appropriate rules, quality assessment, and later improvement.

5. Conclusion

From the perspective of combining theory with practice, combined with the current situation of data governance in logistics enterprises, this paper focuses on how data governance supports the development strategy of the company by using the concept of whole process management. In terms of top-level design, the most important measures of data governance and the establishment of data governance support platform should effectively control the

development of data governance. In terms of data strategy, we should adhere to the principle of combining short-term goals and long-term goals to achieve our own intelligent transformation. In terms of organizational structure and responsibilities, a system of vertical work management of board responsibility, information department and business department is established. Focusing on the goal of data governance, specific measures for data governance are proposed : strengthening the construction of data governance support technology platform, supporting data full value chain management, and continuously improving data quality. When the level of data governance reaches a certain level, it is necessary to break the data barrier and realize the whole industry flow of data to ensure its full value.

REFERENCES

[1]   Ding Chengfeng, Wang Yongyuan, Zhu Yushuai. Analysis of data assets sorting in enterprise data security governance [J]. China management informatization, 2021, 24 (18) : 113-114. https://kns.cnki.net/kcms2/article/abstract?v=3uoqIhG8C44YLTlOAiTRKibYlV5Vjs7iy_Rpms2pqw bFRRUtoUImHVbqUuamVQ-Ll80MMYaXTjrvGgBpORHiTG6XfG4lrX6T&uniplatform=NZKPT.

[2]   Wang Shuai, Lin Tan. Motivation, structure and suggestions for the development of smart logistics [J]. China Circulation Economy, 2019,33 (01) : 35-42.DOI : 10.14089 / j.cnki.cn11-3664 / f.2019.01.004.

[3]   Feng Wenjing. Discussion on the strategic development of modern logistics enterprises [J]. Business   Economics   Research,   2021   (21)   :107-109. https://kns.cnki.net/kcms2/article/abstract?v=3uoqIhG8C44YLTlOAiTRKibYlV5Vjs7iy_Rpms2pqw bFRRUtoUImHRitCShswgu9ayA9m9u08-ut71b9uM0DddF7GFXni795&uniplatform=NZKPT.

[4]   Zhang Li. Port logistics service big data governance demand analysis [J].Economic outlook of Bohai Rim, 2018(07):62-63.DOI:10.16457/j.cnki.hbhjjlw.2018.07.041.

[5]   Huang Yin. Data-driven innovation of logistics enterprises - a multi-case analysis [J]. China 's circulation economy, 2018,32(09):20-29.DOI:10.14089/j.cnki.cn11-3664/f.2018.09.003.

[6]   Wang Shuai, Lin Tan. Motivation, structure and suggestions for the development of smart logistics [J]. China Circulation Economy, 2019,33 (01) : 35-42.DOI : 10.14089 / j.cnki.cn11-3664 / f.2019.01.004.

[7]   Yang Dong, Mao Zhiqi. Institutional construction of public data opening and value utilization [J].Journal of Beijing University of Aeronautics and Astronautics (Social Science Edition), 2023,36(02):36-45.DOI:10.13766/j.bhsk.1008-2204.2023.0016.

[8]   Yuan Kang, Cheng Yang. Data risk of financial technology and its prevention and control strategies [J].Journal of Beijing University of Aeronautics and Astronautics (Social Science Edition), 2023,36(02):46-58.DOI:10.13766/j.bhsk.1008-2204.2022.1717.

[9]   Ruohonen Jukka,Mickelsson Sini. Reflections on the Data Governance Act[J]. Digital Society,2023,2(1). DOI:10.1007/S44206-023-00041-7.

[10]   Ndlovu Kagiso,Mauco Kabelo Leonard,Chibemba Star,et al. Assessment of Stakeholder Perceptions and Attitudes Toward Health Data Governance Principles in Botswana: Web-Based Survey.[J]. JMIR formative research,2023,7. DOI:10.2196/41408.

[11] SolàMorales Oriol, Sigurðardóttir Katla, Akehurst Ron, et al , Cunningham David,de Pouvourville Gérard. Data Governance for Real-World Data Management: A Proposal for a Checklist to Support Decision Making.[J]. Value in health : the journal of the International Society for Pharmacoeconomics and Outcomes Research,2023. DOI:10.1016/J.JVAL.2023.02.012.