Research on Supply Chain Performance Management based on Big Data Application

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Abstract: With the coming of the era of big data and the strengthening of competition among enterprises under the condition of marketization, enterprises must make full use of big data technology to improve their supply chain performance management level, so as to establish an advantageous position in the competition. This paper first introduces the theory of supply chain performance management based on big data application, then analyzes the impact of big data application on supply chain performance, and finally gives the strategies to improve the supply chain performance of enterprises.

1. Introduction
The development of information technology has led to great changes in the market structure, thus promoting changes in business model and structure of enterprises. With the advent of the era of big data, enterprises are facing the opportunities brought by data technology. At the same time, the rapidly changing needs of customers and the rapid development of technology have brought new challenges to enterprises. As an important part of enterprise management, the optimization of supply chain management is related to the survival and development of enterprises. In the process of supply chain management, a large amount of information will be generated continuously. Combining with big data technology to optimize supply chain performance management, information mining technology is developed based on big data, so as to find out the methods to improve the rapid response ability and customer satisfaction of supply chain, which has important practical significance for the development and operation of enterprises.

2. Supply chain performance management theory based on big data application

2.1 Relationship between big data application and supply chain performance
Through the application of big data technology, enterprises in the supply chain nodes can be connected. It can not only share information in real time, but also process information in time, such as information tracking, screening, analysis and calculation, and listen to the support for the final decision-making of enterprises. In addition, the application of big data technology can obtain accurate information support in time and effectively, so as to significantly improve its supply chain performance. By mining the valuable data in the information base, we can establish the market prediction model, carry out targeted business activities, and finally achieve the continuous improvement of the enterprise supply chain performance.

2.2 Theoretical model of big data application and supply chain performance
The application of big data technology to build enterprise information system platform to manage and process various kinds of information makes the connection between enterprise supply chain nodes...
smoother and information sharing more efficient. Based on the above analysis, it can see that the relationship model of big data, information sharing and enterprise supply chain performance is shown in Figure 1.

![Figure 1. Big data, information sharing and supply chain performance relationship model](image)

2.3 The hypothesis model of big data application and supply chain performance
The value of supply chain management lies in the quick response to market changes and the satisfaction of customers' personalized needs in the shortest time. The application of big data to improve the performance of supply chain is mainly to obtain comprehensive customer demand data, so that the market response ability of supply chain can match customer satisfaction, and gradually improve the level of supply chain performance management. Based on the above mechanism of big data application on supply chain performance, the hypothesis model between the two is established as shown in Figure 2.

![Figure 2. Hypothesis model between big data application and supply chain performance](image)

3. Research on the impact of big data application on supply chain performance

3.1 The impact of big data application on supply chain performance
The application of big data has a significant positive impact on the supply chain performance. The supply chain performance management based on data mining can enable enterprises and their partners to accurately grasp market changes and customer demand, so as to significantly improve their own supply chain performance level. Similarly, big data cloud technology will also bring positive promotion to the performance of supply chain. Enterprises in each node of supply chain can promote the timely and effective transmission of information between supply chains through data cloud computing and other technologies. In addition, the supply chain enterprises can also significantly improve the performance of the supply chain through the establishment of cloud technology platform.
3.2 The impact of information sharing on supply chain performance
Information sharing also has a significant positive impact on supply chain performance, which is reflected in the three dimensions shown in Figure 3. Strengthening information sharing will help to further improve the performance level of supply chain. Among them, the optimization of sharing information content is the method to optimize the performance of supply chain, and the optimization of information sharing level is the process to optimize the performance of supply chain.

![Diagram of information sharing's impact on supply chain performance](image)

Figure 3. Dimension of information sharing’s impact on supply chain performance

3.3 The influence of big data application on information sharing
On the whole, big data application has a significant positive impact on information sharing from both data mining and cloud technology application dimensions, but the opposite is not true. In addition, cloud technology has a negative impact on the level of information sharing, while data mining has no significant positive impact on the level of information sharing.

4. Strategies to improve supply chain performance

4.1 Building a big data platform among enterprises
As mentioned before, big data helps to enhance information sharing and supply chain performance. Therefore, enterprises should establish a data information platform between supply chain nodes, but at the same time, building a big data platform between enterprises requires a high degree of trust among their partners. In addition, it is necessary to establish the benefit distribution system and risk prevention system supporting the big data platform, and strengthen the technological learning of data mining and transmission for the node enterprises in the supply chain, so as to help the enterprises to obtain effective supply chain data and further enhance the cooperation between enterprises.

4.2 Strengthen information sharing between supply chains
Strengthening the information sharing of supply chain is also helpful to significantly improve the performance of supply chain. First of all, enterprises should expand the level of information sharing, enrich the content of information sharing, and strengthen multi-level and deep level information sharing with cooperative enterprises. Secondly, we should improve the quality of information sharing, ensure the accuracy, integrity and timeliness of information sharing among enterprises, and ensure that the responsibilities and obligations in information transmission are formulated and strictly implemented. Finally, we should guarantee the security of shared information, ensure the transmission of information security, ensure the reliability of information sharing from the technical level, and strengthen the understanding and construction of data confidentiality.

4.3 Optimize the process and method of supply chain performance management
The establishment of data platform of supply chain performance management based on big data needs to formulate implementation process matching with it. The supply chain performance management...
method based on big data application puts forward new challenges to employees’ working habits. It needs to train employees to form new working habits. In addition, in order to ensure the effective implementation of supply chain performance management based on big data, a lot of safeguard measures will be needed. Perfect safeguard measures are the premise to ensure the effective implementation of enterprise supply chain management, and also the necessary conditions to improve the efficiency of enterprise management and employees. Therefore, it is of great significance to improve and optimize the existing supply chain performance management process and methods, and establish the supply chain performance management process based on big data application.

5. Conclusions
The establishment of supply chain management system based on big data application is conducive to enterprises facing increasingly fierce market competition pressure. Because data application and information sharing are important factors to increase the performance of supply chain, enterprises should make full use of information sharing and big data application in the process of improving the performance of supply chain. In addition, in order to improve the management level of supply chain performance, enterprises need to build a big data platform between enterprises, strengthen the information sharing between supply chains, improve and optimize the process and mode of supply chain performance management.

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