Research on Operation Mode from the Perspective of Flexible Supply Chain Management-Taking the Problem of Adapting Differentiated Demand as an Example

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Abstract. With the intensification of global market competition and the diversification of consumer demand, enterprises are facing more and more challenges, so it is particularly important to solve the problem of adapting differentiated demand in flexible supply chain. This paper aims to explore the operation mode from the perspective of flexible supply chain management, so as to better solve the problem of adapting differentiated demand, and analyze how the operation mode of flexible supply chain can better solve the problem of adapting differentiated demand by improving strategy, optimizing process and updating technology. Through case analysis, representative enterprise examples were selected for in-depth analysis. It is found that by adopting strategies such as modular design, supply chain collaboration, and inventory management optimization, companies can effectively improve the level of personalization of products and services and shorten the response time. Selecting the appropriate operation mode has a significant effect on meeting the differentiated demand. Enterprises should pay attention to the operation and construction of flexible supply chain, and realize the agility and flexibility of flexible supply chain operation mode through technology and management innovation.

Keywords: Supply chain management; Flexible supply chain; Operation model; Demand for differentiation

1 Introduction

Supply chain management is an important aspect of modern business operations, and its flexibility and responsiveness will directly affect the company's competitiveness and market adaptability. As global markets continue to evolve and technology rapidly advances, customer needs are becoming increasingly diverse and personalized, driving the need for businesses to plan and execute their supply chain strategies with increased flexibility. In recent years, the efficiency improvement of supply chain, risk control and the handling of various problems have become increasingly important, and related research is also diverse. For example, some scholars have recently studied the supply chain quality collaborative management, and found that the supply chain quality management system has dynamic characteristics[1]. Cross-regional risk management is also an important issue in the field of supply chain management[2]. Analyzing the risk control of supply chain from the perspective of cooergic decision-making can greatly improve the effectiveness of risk control[3]. In the context of

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today's globalization, the supply chain analysis from the perspective of e-commerce is also of great research value[4]. Optimizing the global benefits of the supply chain requires the coordination of member enterprises to achieve. The non-parametric method of efficiency evaluation is widely used. By establishing a bargaining model, the optimal profit mix of member enterprises based on Nash equilibrium is obtained, and the equilibrium pricing of intermediate products to achieve the optimal allocation scheme is given, which can greatly improve the efficiency of enterprises[5]. Some scholars have studied the proximity of supply chains and found that quality improvement is slower in geographically dispersed supply chains[6]. Through empirical analysis, this paper studies the mechanism of retail enterprises'supply chain flexibility affecting supply chain competitiveness from the perspective of robustness, so as to guide retail enterprises to effectively improve supply chain competitiveness[7]. From the perspective of supply chain flexibility, this paper analyzes the impact of big data application on enterprise performance. It is found that big data application has a significant positive impact on supply chain flexibility and enterprise performance, supply chain flexibility has a significant positive impact on enterprise performance, supply chain flexibility as an intermediate variable, has an indirect impact on big data application and enterprise performance, and plays a partial mediating effect[8]. Previous studies have focused on optimizing the cost efficiency and stability of supply chains, with some limitations on the systematic study of flexible supply chains. The rise of differentiated demand requires the supply chain not only to be efficient and stable, but also to have the ability to respond quickly to changes. In this context, this study analyzes the flexible characteristics and adaptive mechanism of supply chain operation from the perspective of innovation, and further discusses how to deal with the problem of differentiated demand adaptation through case studies. This study not only helps to strengthen the theoretical understanding of SCM, but also provides empirical data and framework with practical guidance to enable firms to operate more flexibly and efficiently in uncertain markets. Through the flexible characteristics of supply chain and the adaptation mechanism of operation mode, this paper further explores how to solve the problem of adapting differentiated demand by using case analysis method. The research not only contributes to the theory of supply chain management, but also helps enterprises to operate more flexibly and efficiently in the uncertain market. In view of this, this study will explore and evaluate how different operation modes can effectively meet the differentiated needs of customers under the framework of flexible supply chain management, as well as the feasibility and efficiency of these operation modes in practical application. At the same time, in view of the risks and challenges of flexible supply chain management that have not been fully systematized, feasible suggestions are put forward.

2 Elaboration and analysis

2. 1The advantages of flexible supply chain management operation mode

With the support of modern information technology, flexible supply chain management has higher risk tolerance and adaptability than traditional supply chain operation mode. In the context of unpredictable market demand changes, flexible supply chain management helps enterprises reduce inventory risks, reduce costs and achieve effective cost control through real-time demand forecasting and effective inventory management. In terms of risk taking, flexible supply chain management has significant advantages. Due to the uncertainty of

market demand changes, flexible supply chain management can flexibly respond to various risks, including market demand fluctuations, supplier instability, and logistics disruptions. By means of reasonable resource allocation, optimizing supply chain process, reducing waste and loss, flexible supply chain management can reduce the business risk of enterprises and improve the ability of enterprises to resist risks. In addition, flexible supply chain management always maintains a high degree of flexibility and adaptability. According to customer feedback, constantly improve their own work, improve customer satisfaction. In terms of production planning, flexible supply chain management can timely adjust the production plan according to the change of market demand, and avoid the situation of excess or shortage. This helps to improve the production efficiency and resource utilization rate of enterprises and reduce production costs. Flexible supply chain management can effectively shorten the delivery time, improve the delivery accuracy, enhance the competitiveness of enterprises, and ensure the efficient operation of supply chain. In order to better meet the market demand, flexible supply chain management emphasizes the close cooperation and information resource sharing among all links and partners of the supply chain. By establishing strong partnerships, enterprises can better utilize the expertise and resources of their partners to achieve collaborative management of the supply chain and improve overall efficiency. At the same time, flexible supply chain management also pays attention to information sharing and the realization of synergy effect, improves the transparency and traceability of supply chain through information means, and strengthens the communication and collaboration between enterprises and partners. Flexible supply chain management helps enterprises reduce costs, enhance competitiveness, improve customer satisfaction and achieve efficient supply chain operation by means of real-time demand forecasting, effective inventory management, flexible production plan adjustment and close partnership establishment. With the intensification of market competition and the change of market demand, flexible supply chain management will play an increasingly important role in the operation of enterprises.

2. 2The flexible dimension of adapting differentiated demand in the operation mode of flexible supply chain management

The first is product flexibility. The operation model requires flexible product design and development capabilities to meet customer groups with different needs. This includes offering products or services tailored to different regions, markets or customer groups. The second is the production capacity adjustment of products. In the face of differentiated demand, the operation mode should have flexible production adjustment ability. This includes flexible adjustment of production cycles, optimization of supply chains, and flexibility of production lines to accommodate changes in demand for different products or services. It is still necessary to pay attention to the diversification of sales channels: in order to meet the differentiated needs, the operation model needs to have diversified sales channels. This includes the combination of online and offline channels, the coexistence of direct and franchised stores, and partnerships with partners to reach a wider range of markets and customer groups. The flexibility of the operation process is also essential. The operation model needs to have flexible operation process to adapt to the operation mode of different needs. This includes order processing, logistics management, after-sales service and other links, which can be adjusted and optimized according to differences in demand. Finally, data analysis and feedback mechanism. The operation model needs to establish an effective data analysis and feedback mechanism to obtain market feedback and changes in customer demand in time, and

make real-time adjustment and optimization accordingly. This can be done through data analysis tools, market research and customer feedback mechanisms.

2. 3The improvement direction of flexible supply chain management operation mode

The direction of improvement of operation mode can be carried out from three aspects: improving strategy, optimizing process and updating technology. By adjusting and innovating in these aspects, firms can improve their competitiveness, increase their efficiency, and respond to changes in the market in a timely manner. In terms of improvement strategies, enterprises can develop differentiated market positioning and competitive strategies based on market segmentation and customer needs. This may include product customization for different customer groups, strategies to expand into new markets or consolidate existing market positions, offering unique products or services to differentiate competitors, etc. The optimization process involves the improvement of the entire operational process. This can include optimizing supply chain management and improving the efficiency of logistics and supply; Adopt refined production planning and scheduling to reduce production costs and improve delivery efficiency; Strengthen customer relationship management to enhance customer satisfaction and loyalty; And implement quality management and continuous improvement of quality management mechanism to reduce defect rate and improve product quality. Updating technology is the introduction of new technologies and innovations to improve the operating model. This can include the adoption of advanced production technologies and processes that improve production efficiency and product quality; Applying big data and artificial intelligence technologies for data analysis and forecasting to improve decision making and optimize operations; Building digital platforms and Internet technologies to improve the efficiency of sales channels and customer experience; And follow the trend of automation and intelligence, technology upgrading and transformation.

2. 4Case study of adapting differentiated demand under flexible supply chain management operation mode

Through market research, field visits and other methods, we found that TechGadget has outstanding advantages in product innovation, production agility and customer customization. TechGadget is focused on developing and producing unique technology products that have differentiated competitive advantages in the marketplace. It adopts flexible supply chain management operation mode, which enables enterprises to quickly respond to changes in market demand. TechGadget is also able to provide personalized product customization services to meet the specific needs of different customers. They work with customers to understand their specific requirements and preferences, and then design and produce according to the needs. This flexibility allows firms to meet the differentiated needs of different customers in the market. TechGadget's leading position in the industry, replicability of its business model, and success stories with empirical benefits are all indicators to look at. According to the latest market research data, TechGadget has made considerable progress over the past year. Their sales grew by 15%year on year and their market share reached 12%. This is thanks to the brand's innovative products and excellent user experience, which stand out in the fierce competition in the technology market. In terms of supply chain management, TechGadget adopts an advanced logistics system and supply chain collaboration platform. They work closely with suppliers and logistics partners to achieve transparency and efficiency

in the supply chain. This helps them deliver products on time and optimize inventory management to meet consumer demand. Overall, as a brand focused on innovation and technology, TechGadget has achieved remarkable achievements under the flexible supply chain management operation model. Through cooperation with suppliers, continuous R&D and innovation, and optimized supply chain management, they have successfully solved the problem of adapting to differentiated needs, met consumer demand for innovative technology products, and achieved business growth while remaining competitive in the market.

3 The proposal of solutions

3. 1Methods for solving the problem of adapting differentiated needs

By adopting strategies such as modular design, supply chain collaboration, and inventory management optimization, enterprises are able to improve the level of personalization of products and services and shorten the response time in a rapidly changing market. These management operation models can effectively solve the problem of adapting to differentiated needs. The flexible supply chain management model encourages enterprises to adopt modular design and divide products into multiple modules that can be independently produced and assembled. This design can meet the differentiated needs of different consumers, because enterprises can flexibly assemble different modules to produce products that meet personalized needs according to market demands and consumer feedback. Modular design can also facilitate rapid R&D and updating of products, enabling enterprises to better adapt to market changes. The flexible supply chain management model emphasizes the coordination and cooperation among all links of the supply chain. By working closely with suppliers, manufacturers and logistics partners, enterprises can respond more quickly to the differentiated needs of consumers. Supply chain synergy can help firms adjust production and inventory plans in time to meet the needs of different product configurations while receiving demand. This collaboration can also improve logistics and transportation efficiency, ensure timely delivery of products, and shorten the sales cycle. The flexible supply chain management model emphasizes optimizing inventory management to reduce inventory overhang and improve inventory turnover. By integrating supply chain data and adopting advanced predictive analytics techniques, businesses can more accurately forecast market demand and consumer preferences, avoiding excessive inventory or undersupply situations. Reasonable inventory management can help enterprises better respond to differentiated demands, quickly adjust production plans, and flexibly meet the needs of different consumers. The flexible supply chain management model focuses on data collection and analysis. By collecting and analyzing consumer demand data, market trend data, and supply chain operation data, enterprises can better understand the differentiated needs of consumers and adjust product design, production planning, and supply chain strategies based on data-driven decisions. Data-driven decision-making can help enterprises meet differentiation needs more precisely and improve the level of product personalization and market competitiveness. The flexible supply chain management model encourages enterprises to continuously innovate and apply new technologies. By introducing advanced production technology, logistics technology, and information technology, enterprises can improve production efficiency, optimize supply chain processes, and provide better support for the production of personalized products.

3. 2Current challenges and risk prevention

At present, the operation mode of flexible supply chain management can effectively solve some problems of adapting to differentiated demand. However, it still faces certain risks and challenges under the environment of rapidly changing market demand and the operation mode has not yet reached absolute systematization. Flexible supply chain needs to realize information sharing and transmission among multiple participants and coordination and collaboration of all links under the condition of ensuring information security, so as to accurately predict market demand. However, in this process, the market demand is highly uncertain, and there may be problems of information asymmetry or poor communication between different links. In order to further solve this problem, it is necessary to adopt appropriate information security measures, including encryption technology, rights management and security audit. Establish effective communication channels and information sharing mechanisms, adopt a variety of forecasting methods, such as statistical analysis, market research and data mining, and make dynamic adjustments combined with real-time data to ensure that all parties in the supply chain can grasp the demand changes in time and make corresponding adjustments. At the same time, in order to establish partnerships with multiple suppliers, it is undoubtedly a big challenge to select the right supplier based on their capability and reliability. Therefore, when selecting suppliers, sufficient research and evaluation should be carried out, including the supplier's quality management system, delivery capacity and flexibility. In addition, inventory management risk is a threat to flexible supply chain. Flexible supply chains need to balance inventory costs and service levels. Due to the uncertainty of demand, inventory management faces certain risks, too high inventory may lead to capital occupation and loss, while too low inventory may not be able to meet the differentiated demand. In order to reduce this risk, reasonable inventory control strategies can be adopted, such as safety inventory, regular inventory and supply chain coordination. In general, to solve the problem of adapting differentiated demand under the operation mode of flexible supply chain management, it is necessary to comprehensively consider the challenges and risks of supply chain coordination, demand prediction, supplier selection, inventory management and information security, and take corresponding preventive measures to ensure the stability and flexibility of the supply chain.

4 Suggestion

4. 1Suggestions on the operation model

Develop systematic process and standardized operation. In order to ensure the stability of flexible supply chain management operation mode, clear and systematic operation process, standardized process documents and training plans are formulated. Strong information technology systems need to be built first. Powerful information technology in flexible supply chain management provides support for the coordination and information sharing among all links of the supply chain. For example, through real-time data collection and analysis, as well as advanced supply chain management software, fast and accurate demand forecasting, inventory management, and production planning can be achieved, thus improving operational flexibility and responsiveness. The second is to establish stable supply chain partnerships. Working with long-term and stable partners is the basis for building mutual trust and

understanding. Through close cooperation with suppliers and partners, efficient synergy between all links of the supply chain can be achieved, and joint response to market changes and differentiated needs can be achieved. Continuous data analysis and improvement is also essential, and an effective data analysis team is established to collect, analyze and interpret supply chain related data. Based on the results of data analysis, identify potential problems and bottlenecks in the operation model and take appropriate improvement measures. At the same time, it is recommended to establish a continuous improvement mechanism to ensure that the operation model continues to evolve and adapt to the changes in the market. Finally, flexible organizational structures and personnel training are needed. Flexible organizational structure to adapt to changing market needs. In addition, it is also necessary to cultivate employees'cross-department cooperation ability and flexible thinking to cope with the challenge of adapting to differentiated needs.

4. 2Recommendations for risk control

The risk of demand volatility is common in the current environment. Especially in the case of differentiated demand. Use data analysis and forecasting technology to accurately forecast demand, maintain close communication and cooperation with customers to understand their demand changes and trends, and establish reasonable inventory management and production planning mechanism, so that timely adjustments can effectively deal with the risks brought by demand fluctuations. For supplier risks, a supplier risk assessment mechanism can be established to evaluate suppliers'financial status, supply capacity, production flexibility, supply chain visibility and other factors, and establish long-term cooperative relations with them. The flexible supply chain management model also relies on the synergy and cooperation between the various links of the supply chain. However, in this process, there are certain threats to the security and delay of information sharing and the unreliability of partners. It is necessary to build an information technology platform for supply chain coordination and take corresponding protection measures to ensure information security. Technological risks cannot be ignored either. Technical risks may lead to system failure, data leakage, or loss of information. Strengthening the security and stability of information technology, including regularly updating systems and software, backing up data, strengthening cybersecurity and protective measures, and conducting regular system inspections and tests, can provide strong support to the supply chain. Finally, we should always pay attention to cost control. Cost analysis and management should be carried out to seek ways to optimize costs, such as improving production efficiency, optimizing inventory management and seeking cost-effective partnerships to deal with the possibility of risk occurrence.

4. 3Suggestions for flexible dimension control

In the operation mode of flexible supply chain management, in order to effectively control the flexibility dimension that ADAPTS to the differentiated demand, it is necessary to focus on the flexibility level. In the product design phase, the flexibility of the product is considered. In the production phase, production flexibility is considered. Adjustable production lines and multi-functional workstations are adopted to realize rapid switching and adjustment of production tasks. In addition, flexible production scheduling and dispatch systems are used to adjust and optimize production processes in real time according to demand changes. In supply chain management, supply chain flexibility is considered. Build a flexible supply chain

network. Establish partnerships with multiple suppliers to ensure supply reliability and flexibility. At the same time, establish backup suppliers and backup logistics channels to cope with emergencies and demand changes; Establish a close information sharing and collaboration mechanism with supply chain partners to achieve rapid response and collaboration. In addition to the control of the flexibility dimension at the flexibility level, attention should also be paid to the market agility and performance evaluation improvement system. Strengthen performance appraisal of flexible supply chain management and carry out continuous improvement. Establish key performance indicators and evaluation system, conduct real-time monitoring and evaluation of supply chain flexibility dimensions, and promote continuous improvement and innovation of supply chain.

5 Conclusion

According to the research and analysis in this paper, the flexible supply chain management operation model has important advantages and potential in solving the problem of adapting differentiated demand. By adopting strategies such as modular design, supply chain synergy, and inventory management optimization, firms are able to increase the level of personalization of products and services and reduce response times in a rapidly changing market. Flexible supply chain management mode also emphasizes the importance of data analysis and technological innovation. By collecting and analyzing consumer demand data, market trend data and supply chain operation data, it can potentially help enterprises better understand the differentiated needs of consumers and adjust product design, production plan and supply chain strategy according to data-driven decisions. In addition, the flexible supply chain management mode also needs to pay attention to the challenges and risks of supply chain coordination, supplier selection and information security, and take corresponding preventive measures to ensure the stability and flexibility of the supply chain. Enterprises can control some potential risks here. In practice, the flexible supply chain management operation mode has achieved some successful cases. For example, through cooperation with suppliers, continuous R&D and innovation, and optimized supply chain management, TechGadget has successfully solved the problem of adapting to differentiated needs, met consumers'demand for innovative technology products, and achieved business growth while remaining competitive in the market.

To sum up, flexible supply chain management operation mode is an effective way to solve the problem of adapting differentiated demand, which can help enterprises improve competitiveness, meet consumer needs, and achieve sustainable development. However, the flexible supply chain management model still faces some challenges and risks in the implementation process, such as the security and delay of information sharing, the reliability of supplier selection, and the risk of inventory management. Therefore, enterprises need to take corresponding preventive measures, such as strengthening information technology security, establishing supplier risk assessment mechanism and optimizing inventory control strategy, to ensure the stability and flexibility of supply chain. At the same time, enterprises should also pay attention to the importance of data analysis and technological innovation, and constantly improve their own ability and competitiveness, so as to adapt to the changes in the market and the challenges of differentiated needs. By comprehensively considering these factors, enterprises can better cope with the problem of adapting to differentiated needs and achieve business growth and sustainable development.

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