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Research on Value Co-Creation Mechanism in the Digital Transformation of Manufacturing Enterprise Supply Chain

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Abstract. With the advent of the era of big data, the relationship between manufacturing enterprises and consumers is getting closer. Under the value co-creation model, the new value generated by the interaction between manufacturing enterprises and consumers is conducive to improving the competitive advantages of manufacturing enterprises and consumers' satisfaction with products and services. This paper takes the digital transformation of the supply chain of manufacturing enterprises as the research object and is dedicated to studying its value co-creation activities. By sorting out the relevant literature, the paper mainly focuses on two issues: First, the digital transformation process of the supply chain of manufacturing enterprises. Second, combining cases to analyze the various stages of the value co-creation activities of the digital transformation of the supply chain of manufacturing enterprises. This paper selects the "consumer experience-led" type to discuss the case of Haier, a manufacturing enterprise, as the research object. Through research, we concluded that: in the process of joint participation in value creation between manufacturing enterprises and consumers in the digital transformation of the supply chain, both enterprise value and consumer value have increased. This paper provides a reference for research and practice in this area.

Keywords. Manufacturing enterprise supply chain, digital transformation, consumer experience, value co-creation

1. Introduction

In the era of big data, the complexity of the supply chain of our manufacturing companies is increasing rapidly. The speed of product replacement is accelerated, and consumers' needs for product customization and product quality are increasing. To meet customer demands and help companies operate digitally, supply chains need to undergo digital transformation. Hennelly et al. believe that digitization is the use and adoption of external digital technologies by organizations to improve their supply chain and operational performance [1]. According to the research of previous scholars, this paper summarizes the definition of digital transformation of the supply chain as follows: supply chain digital transformation is the process of optimizing and improving supply chain management through the application of digital technologies and information systems to increase efficiency, visibility and responsiveness.

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The main body of value co-creation includes the manufacturing enterprises themselves and the group of consumers. The core content of value co-creation is to change the positioning of consumers and the original supply chain nodes in the value chain, to allow consumers to participate in the entire process of creating value, and to allow customers to participate in the service and production process of the enterprise. Create value for enterprises, and enterprises can gather through the platform to form complementary advantages and share resources. Based on the digital transformation of the supply chain of manufacturing enterprises, the problem of value co-creation is discussed, and the systematic research of the problem is strengthened. Jaakkola and Alexander (2014) [2] analyzed the impact of customer participation in the value creation of manufacturing enterprises, presented four different customer participation models, and discussed the value effects experienced by different stakeholders. Wang Ligai (2020) [3] established a value co-creation model for manufacturing enterprises based on the concept of value co-creation and put forward corresponding countermeasures and suggestions for the development of its service model. Wu Kai (2020) [4] discussed the value created by brands from the perspectives of local value, consumer value perception, consumer value appreciation, and brand local value. Prahalad and Ramaswamy [5] argue that the interaction between the customer and the firm is fundamental to value creation. Firstly, the essence of value co-creation is the co-creation of customer experience between the firm and the customer and the continuous creation of its own experience in products and services. Secondly, the interaction between firms and consumers is the fundamental way to generate value. Value co-creation, on the other hand, is generated by the heterogeneous interactions between customers and firms. Thus, value co-creation is a consumer-business interaction and co-operation that goes beyond the traditional medium of supply and demand.

2. Related Work

This paper provides an in-depth discussion of the current state of supply chain digital transformation in manufacturing companies and the value of the benefits it brings, followed by an examination of the factors that influence value co-creation. Finally, using Haier's COSMOPlat as a case study, based on the 'Consumer Experience Dominant Logic' framework, the paper discusses how this manufacturing company achieves value creation in the process of supply chain digital transformation. This paper adopts a single-case study approach, selecting COSMOPlat, a highly representative and best-practice feature of the Haier Group's intelligent manufacturing platform, to explore how manufacturing enterprises achieve value co-creation in the process of digital transformation.

3. Digital Transformation of Manufacturing Enterprise Supply Chain and Its Benefit Value

3.1. Status Quo of Digital Transformation of Manufacturing Enterprise Supply Chain

Many large domestic manufacturing enterprises are carrying out or preparing to carry out the digital transformation of the supply chain. For example, Haier uses COSMOPlat to open up a communication platform from consumers to suppliers, from

demand terminals to supply terminals. Through the application of the Internet of Things and big data technology, it can create accurate, efficient and low-risk online and offline communication platforms. However, for small and medium-sized manufacturing enterprises, there are still many difficulties to be overcome in the process from the development of the implementation programme to the final implementation of the programme. There is still a lot of room for progress in the digitization of the supply chain.

3.2. Changes in the Digital Transformation Method of the Supply Chain

Traditional supply chains employ a linear and reactive approach, where the functioning of the chain depends on specific predefined workflows. Historical transactions from the system control how the chain works, not real-time conditions. Problems of information isolation and lag may exist.

Supply chain digital transformation uses a network approach to apply digital technologies throughout the supply chain to achieve a more integrated, dynamic and predictive supply chain. These techniques help identify problems earlier and respond proactively to outages based on real-time conditions rather than predefined workflows. Connectivity is critical to eliminating silos and providing visibility across the supply chain. For businesses, the digital transformation of the supply chain is the process of delivering digital products to their customers, leveraging electronic technology in all aspects of the end-to-end supply chain [6].

3.3. Benefit Value After the Digital Transformation of the Supply Chain

3.3.1. Cost Reduction and Efficiency Increase

Manufacturing companies use the real-time sales and demand data provided by the digital transformation of the supply chain to adjust their strategies, focus on selling high-demand products. In addition, most manufacturing companies spend a lot of money and time maintaining problems and products left over from legacy systems, and supply chain digital transformation can save time and money by integrating efficient processing processes and quickly identifying problems [7].

3.3.2. Improve Transparency

The biggest change brought about by the digital transformation of the supply chain is the transparency of the closed-loop process of supply, procurement, processing, and sales. It fundamentally shortens the distance between cost and profit, and between resources and resources [8]. The distance between users makes the entire supply chain active at once, and the efficiency is rapidly improved. This transparency facilitates the detection of previously unseen inefficiencies, improved relationships between different stakeholders, and reduced time-to-market as bottlenecks are eliminated.

3.3.3. Improve the User Experience

An improved user experience means that transformation is valuable. Digital transformation of the supply chain enables systems to view and gain insights into the consumer spending process, better understand customer preferences as well as needs

[9], understand inventory surplus, available services and products, save on sales, shorten lead times, and make the entire buying process more streamlined.

4. Analysis on the Principle of Value Cocreation in the Digital Transformation of the Supply Chain of Manufacturing Enterprises

4.1. The Concept of Value Cocreation in the Digital Transformation of the Supply Chain of Manufacturing Enterprises

The concept of digital transformation of a manufacturing company's supply chain is to realize cooperation and collaboration between all parties in order to co-create added value. This transformation focuses not only on internal improvements within a single enterprise, but also on the optimization of the entire supply chain ecosystem to achieve the goal of co-creation of value. After the digital transformation of the supply chain of manufacturing enterprises, information has become timely and transparent. In order to form a "fan economy" and shorten the distance with consumers, manufacturers have established online communities. In this way, manufacturing enterprises can better understand the real needs of customers, provide customers with better products and services, improve customer stickiness, and enhance competitiveness. For consumers, they can get satisfactory products and services, and a sense of achievement [10]. Thereby, manufacturing enterprises and consumers achieve a win-win situation and achieve a win-win situation. The model diagram is shown in Figure 1.

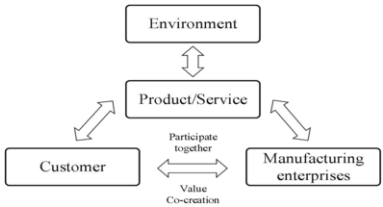

Figure 1. Value co-creation model diagram

4.2. Manufacturing Enterprise Supply Chain Digital Transformation Value Cocreation and Construction Conditions

4.2.1. Participation of Various Stakeholders and Effective Communication

Effective interaction is the source of generating value, and the participation of effective multiple subjects is a prerequisite for generating value. First of all, to ensure the participation of various stakeholders, it is necessary to clarify their value orientation and adopt various incentives to make all stakeholders participate in the value-sharing system. Secondly, the quality of interaction needs to be ensured in the online environment. Due to the existence of virtual communities, the complexity and diversity of interaction have increased. Therefore, for direct and indirect interactions, different methods should be used to stimulate users' ability to interact.

4.2.2. Diversified Communication Channels and Perfect Service System

Through diversified communication channels, participants can better grasp information and use their knowledge, skills, experience and other actionable resources to create value. Through Internet technology and mobile terminals, etc., optimize the service system of the enterprise, establish and enhance the company's brand value, and promote the behavior of value co-creation among all stakeholders.

4.2.3. Resource Sharing and Information Transparency

In the digital transformation and co-creation mechanism of the supply chain of manufacturing enterprises, although the roles and responsibilities of various stakeholders are different, they are all in the same position, which can ensure the sharing of resources, thereby promoting mutual value creation. At the same time, the transparency of information can enable participants to accurately evaluate risks and benefits, reduce the risk of co-creation, and promote co-creation.

5. Haier's Case Study

The value co-creation system in the relevant literature today mainly includes two logic, "service-led logic" and "consumer experience-led logic". Due to space constraints, this part focuses on the analysis of the field of the "consumer experience-led logic model", and takes "Haier Company" as an example to explore the value co-creation in the digital transformation of the supply chain of manufacturing enterprises.

In order to adapt to diverse consumer demands and maximize user value, Haier first launched COSMOPlat, a supply chain digital platform that introduces users to participate in the whole process experience, in 2016. The core of COSMOPlat is mass customization, which transforms consumers from passive buyers to participants and creators. In the past, the concept of "production and consumption between the enterprise and the user" has been changed to "creating lifelong value for the user". COSMOPlat is a platform for the iteration of the user's whole process experience and a multilateral ecological platform for value-added sharing. The process of value co-creation between users and other members on COSMOPlat is as follows. Figure 2 is the schematic of supply chain value co-creation.

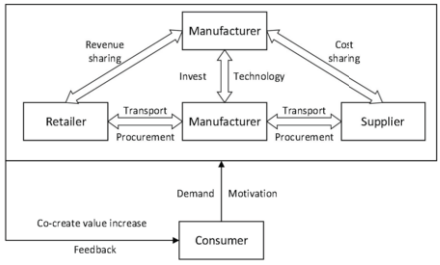

Figure 2. Supply chain value co-creation diagram

5.1. The process of value co-creation

The process of value co-creation among supply chain members consists of three main parts: "connection" - "interaction" - "co-creation".

5.1.1. "Connection Process"

Haier uses COSMOPlat to connect various members in the supply chain, so those manufacturing enterprises, resources and users are directly connected. COSMOPlat allows consumers to participate in all aspects of the entire life cycle, opening up the walls between users and manufacturing companies. On this basis, the connection between suppliers, manufacturers, sellers and consumers is finally realized, which lays the foundation for the next value co-creation through interaction.

5.1.2. "Interaction Process"

In the interactive system, Haier provides resource carriers, and consumers are the main body of value creation. Haier passes its value proposition to consumers through COSMOPlat, and consumers feedback relevant opinions to manufacturers through COSMOPlat. During this interactive process, product design and production begin, and value propositions are generated. Consumers pass COSMOPlat to obtain products and services, share content and interact with other consumers in the community, communicates with manufacturing enterprises, and conducts cooperative production. Figure 3 is the interactive mode diagram:

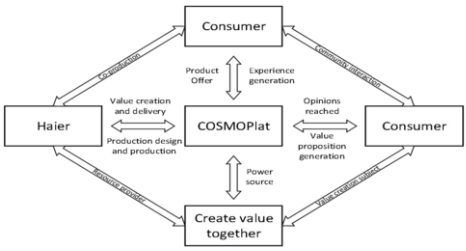

Figure 3. Interaction pattern diagram

5.1.3. "Cocreation Process"

Users can participate in the entire product lifecycle through the COSMOPlat process. Through COSMOPlat, the user experience and feedback of the product are passed to Haier, so that Haier can better understand the user's behavior according to the user's use feedback, and continuously optimize and improve the product to improve the user's satisfaction.

For Haier, COSMOPlat can obtain user experience and feedback in a timely manner, optimize product functions and services, and improve the efficiency of product upgrades. At the same time, Haier timely feeds back the changed plans to suppliers and sellers to help them make corresponding adjustment strategies to maximize the benefits of other members of the supply chain while satisfying users. The timely response of enterprises helps to retain old customers and attract new users. In addition, Haier has gathered hundreds of millions of user information feedback resources on the COSMOPlat platform, and can also apply to the domestic business model to foreign countries through co-creation activities, expand international business, and help enterprises occupy more international markets.

5.2. The results of value co-creation

The essence of COSMOPLAT is to realize the disruption of the three systems of R&D, marketing and production by working together with stakeholders through the platform to achieve a seamless connection of the entire industry chain. After the digital transformation of the supply chain, the collaborative network structure of enterprises is expanded. Manufacturers, equipment vendors, logistics providers and service providers come together, and each subject is able to innovate and cultivate new modes of cooperation on the platform. In addition, system members are no longer constrained by enterprise boundaries, resource utilization is expanded, and asset flexibility and specialization is increased. Digital transformation not only reduces social and procurement costs for network members, but also improves operational forecasting and risk identification [11].

6. Conclusion

With the development of the times, more and more manufacturing enterprises are implementing digital transformation of their supply chains. In the process of transformation, consumers join in to make enterprises gain more value. The article analyses the role of enterprises and consumers in the process of value co-creation and the process of value co-creation, which provides a reference for the implementation of value co-creation in digital transformation of supply chain of manufacturing enterprises in China, and lays a theoretical foundation for further in-depth research.

This study is based on a single case study, which is still limited in terms of the target audience and only examined from the consumer experience-driven logic. Future research should increase the number of samples from specific industries, conduct multiple case studies, and on this basis, further conduct large-sample empirical research on the value co-creation process in the digital transformation process of manufacturing enterprises.

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