

Research on the Innovation Trend of Modern Enterprise Management in the Context of Digital Economy

-- Taking the Transformation of Manufacturing Enterprises as an Example

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Abstract: Digital economy plays a crucial role in the development process of national economy in China. With the general trend of economic globalization and under China's positive business environment, enterprises come to face increasingly fierce competition and challenges in both the international and domestic markets. In order to achieve rapid and steady development, enterprises need to make good use of the advantage of digital economy, strengthen enterprise innovation management and enhance their market competitiveness. Taking the transformation of manufacturing enterprises as an example, this paper analyzes the challenges faced by enterprises in the digital era of enterprise management, analyzes the causes to them and proposes countermeasures, so as to promote the management innovation of enterprises in the context of digital economy and help them survive and develop in the competitive market environment.

Keywords: Modern enterprise management, Innovation trend, Digital economy.

1. Introduction

According to the investigation of "White Paper on the Development of China's Digital Economy (2022)", China's total digital economy has exceeded 45.5 trillion as of 2021, with a nominal growth of 16.2% year-on-year. The added value of digital economy has increased from 2.6 trillion yuan in 2005 to 35.8 trillion yuan in 2019, and the proportion of the added value of digital economy to GDP has increased from 14.2% in 2005 to 36.2% in 2019.[1] From the above data, we can see that the accelerating effect of digital economy on economic development is becoming more and more prominent. In the environment of Industry 4.0, data acquisition and analysis technology have gradually become a major feature of the transformation and development of the manufacturing industry, and the future competition in the manufacturing industry will unfold in seizing data sources and improving the level of data analysis. China, as a major manufacturing country, has a manufacturing industry that faces the lack of advanced management and enterprise management remains in the traditional mode. Chinese manufacturing enterprises should strengthen the use of digital technology, summarize the theory of production system in a timely manner, closely track the development and changes of new information, integrate emerging technologies such as block chain, and further explore ways to enhance management competitiveness.

2. Concept Definition

2.1. Definition of Digital Economy

The concept of digital economy originated from the "information superhighway" war that took place in the 1990s. It was this battle that laid the foundation for the emergence of the digital economy and ushered in the "digital revolution". In 1993, in the book of "Paradigm Shift: The New Promise of Information Technology" [2], Tapscott proposed after

analysis that the digital economy is coming. Later, Negroponte's "Digital Survival" and Castells' "Information Age Trilogy: Economy, Society and Culture" were published in succession and the concept of the digital economy was becoming well known in the world's major economies while attracting fierce debate in academic circles.

In 2016, in the "G20 Initiative on Digital Economy Development and Cooperation", the definition of the digital economy was given, i.e. a series of economic activities in which the modern information network is the core carrier, the core production factors are mainly digital knowledge and data, and information communication technology is used to promote the improvement of enterprise management efficiency and economic structure optimization. The China Academy of Information and Communications Technology also gave its definition: Digital economy is a new economic form. Digital information is the core production factor of this economic form, the digital technology the technical driving force and the important carrier the modern information network. By integrating digital technology with the real economy, the digital economy can promote the intelligence, networking and digitization of the economy and society.

2.2. Data-driven Enterprise Management

The agility of an enterprise depends on its supply chain. Supply chain agility involves four key processes: procurement, R&D, production and sales (as shown in Figure 1-2). Data-driven supply chain management means that enterprises organize data into data streams in the process of decision making or optimizing production and operation, and extract and organize information streams according to different requirements to facilitate scientific actions with the help of big data. The data-driven technological innovation environment provides companies with a new competitive environment and competition model, which promotes not only the development of the enterprise, but also the change of suppliers and distributors. In this situation, enterprise is

required to integrate internal resources and external resources, and make full use the existing digital resources and digital information technology, and to innovate technologies and

products as appropriate to bringing the enterprise greater economic value.[3]

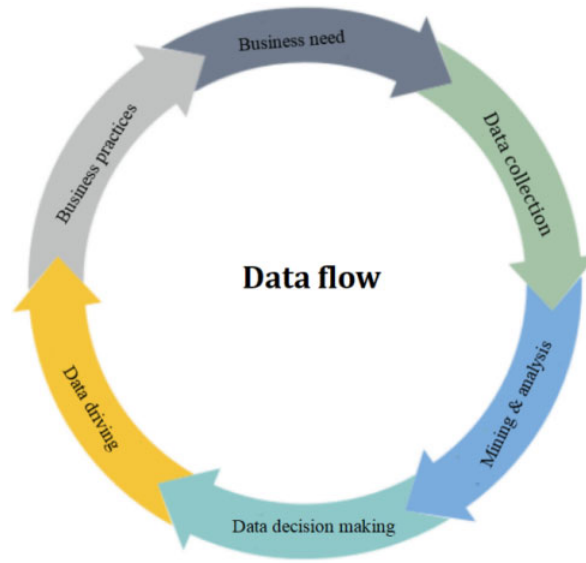


Figure 1. Data-driven closed loop model

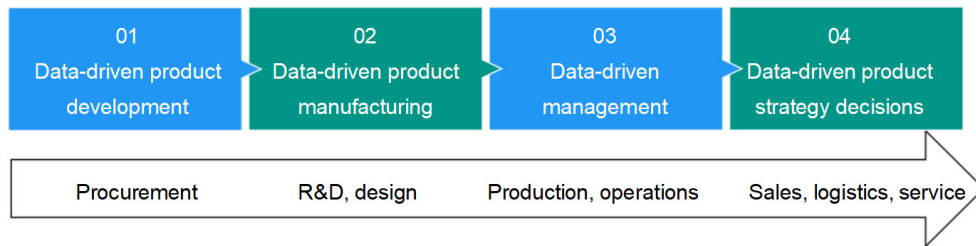


Figure 2. Data-driven enterprise management

3. Digital Challenges Faced by Manufacturing Business Management

Manufacturing industry is the main body and lifeline of national economy. The manufacturing supply chain mainly includes four sides, i.e., the supply side of raw materials and components, production side, sales side and after-sales service side, involving a very wide range. The manufacturing industry is the major part of the whole industrial chain and supplier system. It interacts with agricultural products, services and other industries externally, and includes many processes from raw materials and intermediate products processing to final products manufacturing and logistics internally. Modern manufacturing industry creates a constant supply of goods and elements for the industrial chain and supply chain system, providing an indispensable material

guarantee for the smooth operation and stable growth of the national economy. With the rapid development of information technology in the manufacturing industry, the market is in extremely strong demand for personalization demand. Only by extending to modern manufacturing supply chain management, and achieving the effective connection of R&D, production, operation and distribution data flow, can we realize the agile management.

3.1. Challenges of supply chain management

Supply chain management provides effective collaboration, end-user information, cost, time, efficiency, and flexibility between enterprises. It refers to the planning, operation and control of production materials to achieve optimal results. Information flows and capital flows are strategic. Understanding the needs of end users at this level, as shown in Table 1, plays an important role in business management.

Table 1. Importance of supply chain management[4]

Importance	Connotation
Quality chain and quality management system in supply chain manufacturing industry	Fully create a supply chain management system that establishes a controlled and expeditious quality chain for a series of links from suppliers to customers.
Promote coordinated development among supply chain enterprises	Establish a multi-win, sustainable supply system that brings about synergistic development of upstream and downstream enterprises.
Flexible production to meet market demand	Supply chain management to optimize the customer experience by meeting flexible and diversified needs on the market side.

From the perspective of enterprises' strategy for modern supply chain, cost management has always been the key point of modern manufacturing supply chain operation. At present, most manufacturing enterprises adopt "single variety, high volume and low cost" as the orientation in R&D, design and production, and then push the products to the consumer terminal through multiple distribution channels. This production mode faces fierce homogeneous competition in the market, so the price war is the main way to gain market share. But, the main products of enterprises have consumed too many resources in the price war, as for how to compress costs through digital supply chain management, optimizing profits is a challenge for the management of enterprises.

3.2. Challenges of organizational change

Every response made by enterprises to market changes triggers a new round of changes in the market. In the process of the interaction between enterprises and the market, the market becomes more complicated. To gain a winning chance to develop in the competitive environment, the enterprise has to strengthen the immediate response to market demand. To do so, it is necessary to eliminate redundant layers within the enterprise to reduce impediments to data and information transmission. However, the traditional vertical, multi-layered and closed organizational structure, which relies excessively on the central control of the group headquarters, lacks a flexible and adaptable management mechanism and is becoming increasingly difficult to adapt to the digital economy. The great distance between the group and end users is not conducive to the rapid transformation of data and information into business decisions, which seriously weakens the market competitiveness of enterprises.

3.3. The challenge of independent R&D capability

The technological level is the core in the development and security of the digital economy. Although the development of China's digital economy has been among the world's forefront, but the shortcomings in key areas is obvious, original achievements are lacking, and core technologies are still facing "stranglehold" problem, which weaken the right of speech and competitiveness of China's digital economy and related enterprises. At present, there remain more than 300 key technological weaknesses in China's digital industry, which are monopolized by foreign countries, including basic hardware and software, high-end chips, basic algorithms and so on. China's core key technologies have a great independence on foreign countries. What we can independently produce mostly concentrate in the low-end market and innovation-driven products are mainly dependent on imports, such as the central processor, memory chips, etc.. Most of the patents in the fields of control systems, data acquisition development tools, etc. belong to the epitaxial application categories, lacking inner and core patents which seriously restrict the internationalization of China's digital standards and hinder the digital transformation of the industry.

4. Research on the Innovation Trend of Modern Enterprise Management in The Context of Digital Economy

4.1. The strategic value of digital thinking comes to the fore

Unlike traditional enterprises that focus mainly on attributes such as product quantity, quality and price, enterprise management in the digital economy will revolve around users, and the modes of products and services will be centered on the creation and provision of value. Digitalization is not only the use of digital technology to improve efficiency, but also means a change in competitive attributes and a shift in management thinking and paradigm. Only by focusing on meeting the diversified and personalized needs of users and continuously strengthening close collaboration with ecological partners can enterprises seize digital opportunities. Enterprise management should realize the strategic significance of digital thinking, establish digital transformation awareness as early as possible, and fundamentally transform traditional management concepts. Users should be allowed to effectively and efficiently participate in production, design and other activities, and give full play to the power of intellectual capital by empowering users and employees. [5]

4.2. Data-driven intelligent collaborative management

4.2.1. Flexible organizational structure

For manufacturing enterprises, strategy determines the organizational structure. In the industrialized era, no matter it was a linear system, functional system, linear-functional system or divisional system or matrix system, the enterprise organizational structure was like a pyramid, showing the characteristics of verticalization, bureaucracy and hierarchy, which lacked sufficient flexibility in responding to the changes of external environment and resource allocation. The rapid development of the digital economy has led to a shift in enterprise strategy, which requires enterprises to innovate their organizational structure and re-coordinate, evaluate and plan the combination of people, funds and materials. The strategy of enterprises in the context of digital economy should focus on the pursuit of maximizing enterprise value by enhancing synergy with other enterprises.[6]

The flat organizational structure is user-centered, based on decentralized decision-making by small teams and wider connectivity and aggregation. It accelerates the interaction and integration of resources and becomes the optimal solution for digital transformation within the enterprise. Under the flat organizational structure, the division of labor on the supply side is deepened. Small teams are committed to continuously strengthening their core competencies in user value creation and the core competencies of the enterprise are more lying on value integration, value supply and user experience improvement to provide all kinds of support needed for communication between small teams and users as well as communication and cooperation among small teams through the platform management.

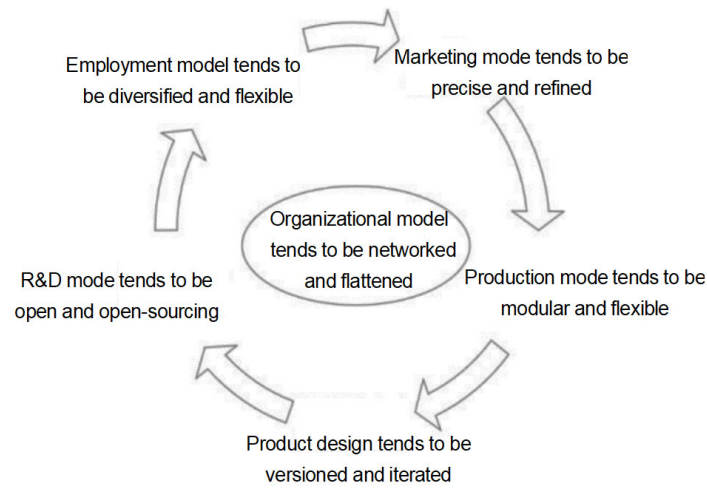


Figure 2. Flexible organizational structure

4.2.2. Intelligent collaborative management

Using instant information acquisition and the information technology to establish an intelligent enterprise center, we fully utilize big data and artificial intelligence to achieve the integration of all enterprise stages such as planning,

production, manufacturing, inventory, and logistics to achieve intra-enterprise collaboration and inter-enterprise supply chain integration, thereby achieving a flexible enterprise relationship. In addition, the CPFR collaborative supply chain inventory management system was carried out (as shown in Figure 3).[7]

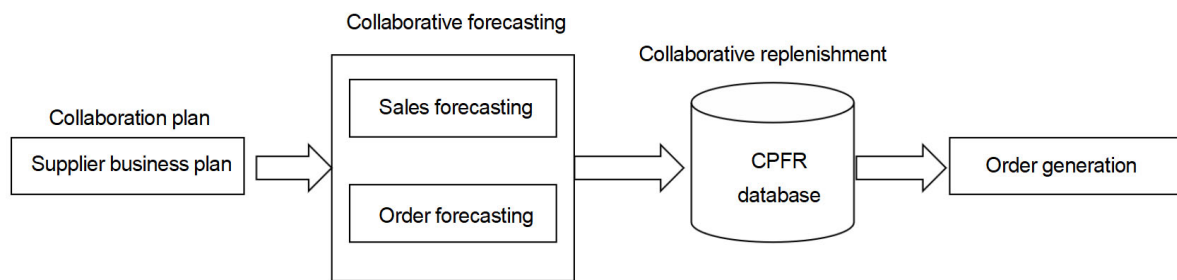


Figure 3. CPFR Collaborative Supply Chain Inventory Management System

Using the whole process of supply chain information control tower, visualization, intelligent detection, intelligent alarm, intelligent replenishment and other technologies to effectively collaborate; through integration and analysis means, describe the market demand, accurately locate the needs of customers, and assist manufacturers to improve the sales strategy of their products. The intelligent enterprise system can complete the all-round digital integration and resource sharing of people, materials and markets, and realize intelligent production, intelligent operation and automated management.

4.3. Enhance independent innovation and R&D capability

Enterprises need to aim at developing their own technological systems with independent intellectual property rights and seize the important breakthroughs in independent innovation of core technologies such as artificial intelligence, block chain and 5G. At the same time, these leading technologies must be integrated with user experience scenarios to activate new industries and stimulate new dynamic energy. Enterprises should strengthen the construction of corporate culture, promote a harmonious, fair, technology-admiring and innovation-adhering corporate work atmosphere, and promote knowledge sharing among employees through knowledge management. R&D center is a

place where intellectuals gather, so it should pay attention to the inheritance and development of knowledge, form a closed loop of knowledge management through knowledge accumulation, output knowledge achievements through knowledge sharing, and improve the technical R&D capability of enterprises in all aspects.[8]

5. Conclusions

Under the wave of global digital revolution, the widespread application of digital technology has led to tremendous changes in industrial structure and industrial organization, and market competition has become more complex and intense, bringing a series of new opportunities and challenges to enterprises. In the face of the "unprecedented changes" in the economic world, digital transformation and intelligent upgrading have become the strategic direction of various enterprises. Looking into the future, user value domination will become the fundamental force driving enterprise management change, digital technology will form data penetration among enterprises to promote the interconnection of information islands, and enterprises choose to "do the right thing" and pursue enterprise value maximization when formulating strategic directions, which is more in line with the inherent requirements of the digital economy.

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