Research on New Retail Supply Chains in the Context of the "Dual Carbon" Goal

Enming Wang, Lei Xiao

Business School, Hubei University, Wuhan 430062, Hubei, China
DOI: 10.32629/memf.v5i1.1603

Abstract: In recent years, new retail business models have emerged and developed at a rapid pace against the backdrop of the "dual-carbon" goal. However, while developing, the new retail industry also faces the conflicting demands of "low carbon and environmental protection" and "timely and efficient". This paper analyzes and discusses the characteristics and development limitations of the new retail industry, as well as the dilemma of low-carbon supply chain development in the new retail industry, and gives corresponding countermeasures and suggestions from the establishment of concepts and standard systems, the connection of internal and external integration of the supply chain, the application of digital technology, and the scientific guidance of consumer concepts to meet the conflicting demands.

***Keywords*:** "double carbon" target, new retail, low carbon supply chain

1. Introduction

New retail refers to a multi-dimensional business model that combines online and offline as well as logistics and distribution through the Internet, and is supported by technologies such as big data and artificial intelligence(Wang,2020). The emergence of new retail is on the one hand due to the fact that in recent years, the development and popularization of the Internet has brought the development of traditional e-commerce to a gradual standstill(Zhou,2022). On the other hand, it is due to the emergence of various types of mobile payment means, which has further broadened consumers' offline shopping choices and consumption scenes. At present, new retail mainly has four business models: website business model, front warehouse business model, convenience store business model and single-store empowerment business model. There are typical real-life cases such as JD.com to Home, Daily Fresh, Yonghui Life and Box Ma Fresh respectively. New retail in better meet consumer demand at the same time, is bound to intensify market competition. And in order to maintain their market competitiveness in the ongoing competition, companies often use environmental pollution as a price. Nowadays, the development of new retail is in the context of the "dual-carbon" goal, where enterprises have to take into account low-carbon environmental protection, energy saving and emission reduction while pursuing profit maximization(Jin,2018).

At the seventy-fifth session of the United Nations General Assembly, to be held in 2020, China for the first time explicitly propose a "dual-carbon" goal, that is to say, striving to "achieve carbon peaking by 2030 and carbon neutrality by 2060"(Fu,2024). Peak carbon refers to the turning point of carbon dioxide and other greenhouse gas emissions from increasing to decreasing after reaching the peak at a certain moment; Carbon neutrality means to offset the carbon dioxide emissions generated in the production process through various ways of energy conservation and emission reduction, and finally achieve "zero emissions". As a major part of social and economic life and enterprise operation, the supply chain has a large amount of resources and industries gathered in each link, from raw material procurement to transportation and recycling processes. Therefore, the carbon emission of each link is crucial to the overall emission reduction of the supply chain(Hong,2023). Introducing carbon management into the supply chain to decarbonize the supply chain can not only rationally utilize resources but also improve the overall performance of the supply chain (Yi,2015). As a national overall strategy, "dual-carbon" will have a comprehensive and fundamental impact on the supply chain of Chinese enterprises.

This paper intends to study the new retail supply chain under the background of the "dual-carbon" goal by analyzing the characteristics and development limitations of new retail, and the development trend and limitations of low-carbon supply chain, and to give corresponding countermeasures and suggestions.

2. The Development Trend and Motivation of New Retail

2.1 The Development Trend of New Retail

(1) Digitalization. Modern technological means such as big data play a driving role in the development of new retail

business models. Although traditional retailers can better understand the differentiated needs of consumers through actual contact with consumers, due to the independence of their data, retailers are unable to accurately know the overall environment of the industry and make corresponding decisions on this basis. With the support of modern technologies such as big data, new retail can better mine user data, make targeted decisions and choose its marketing strategy.

(2) Consumer-centered. The traditional retail model cannot ignore the feelings of consumers while making changes and innovations. The retail industry itself is in a complex and changing market environment, but this change only occurs in the way of interaction between enterprises and consumers, and will not change the purpose of corporate services. Consumers gradually to "consumers + users" for the transformation, from the past passive acceptance of the product to today can be based on their actual needs to find and even customized products.

(3) Borderless. The new retail business model breaks down the barriers between online and offline channels, and combines logistics to better serve consumers, so that the fixed retail model under the traditional retail model in the past has changed dramatically. Under the new retail model, the shopping options available to consumers have become more flexible and changeable, combining online services with offline experience. In addition, the self-built logistics under the new retail model can ensure the timely arrival of the goods purchased by consumers.

(4) New Scene. New retail contacts consumers through innovative interaction methods and further explores consumer information during the contact process. Thereafter, it utilizes big data to recommend products of interest to consumers in a targeted manner, and correlates the physical location of goods with consumer information. On the one hand, it enables consumers to shop free from the constraints of time and space; on the other hand, it alleviates the constraints of the retail industry in terms of inventory and resources, and provides timely and highly satisfactory services to consumers.

2.2 Development Motivation

(1) Upgrading of consumption structure. Upgrading of consumption structure has put forward higher requirements for traditional retailers. With the rapid development of the domestic economy in recent years, the consumption level of consumers and the concept of consumption has been greatly improved and changed, and the consumption structure has been further upgraded. In the traditional concept, consumers tend to pay more attention to the practicality of products; with the upgrading of the consumption structure, consumers have higher requirements for products and services, and pay more and more attention to the cost-effectiveness and differentiation of products while pursuing practicality. In a fiercely competitive market, retailers want to maintain market competitiveness, only through continuous strengthening of self-reform, to provide consumers with more convenient and efficient services, in order to meet the needs of consumers.

(2) Introduction of modern technology. The introduction of modern technology has greatly promoted the development of the entire retail industry. The use of big data and artificial intelligence and other technological means, on the one hand, allows retailers to predict consumer demand based on consumer behavior, and control the production process and the transfer of the physical location of the product according to the prediction results. At the same time, the entire process of product procurement, manufacturing and final sales can also be effectively controlled with the help of technology. Therefore, the use of modern technology can help the retail industry to better meet the needs of consumers, and at the same time can also control the entire production process, reduce the retail industry's production, transportation and inventory costs. These advantages for retailers have greatly contributed to the development of the new retail business model.

(3) Traditional retail limitations. First, with the continuous development of the Internet, the original single offline channel has long been unable to meet the growing needs of consumers, and the supply chain costs of offline sales channels are higher, resulting in the lack of competitiveness of traditional retail in the market. Secondly, the development of online channels enables consumers to access more and better products in a short period of time, which gradually turns consumers into an active party in the market, instead of passively accepting products. Finally, in today's era, consumers are pursuing the use of product attributes, while increasing the importance of product value attributes and scene experience.

(4) Intense competition in the retail market. The popularization of the Internet and the introduction of modern technology has led to a great change in the retail industry as a whole. This change has blurred the boundaries between online and offline channels in the retail industry, and consumers' consumption concepts have also changed. These factors have intensified the competition in the retail industry. In order to maintain their market competitiveness in this environment, retailers can only innovate themselves in line with the times, continuously introduce and upgrade digital technology and reorganize and integrate to enhance their competitiveness.

3. Limitations of New Retail and Its Low-Carbon Supply Chain Development

3.1 Limitations of New Retail Development

In recent years, with the emergence of the new retail business model, the traditional retail industry has been subjected to an unprecedented impact, and its business model has undergone a huge transformation. From the past focus on the physical economy, to today's combination of online and offline dual channels, the use of digital technology to connect the data of the two sales channels, and the development of logistics on this basis, the development of multi-integrated common development. The emergence of this new business model of new retail has upgraded the whole process of goods from production to sales, bringing new market space and development potential to the traditional e-commerce industry, whose development has entered a bottleneck, but in the current economic environment, the development of new retail still has many limitations.

3.1.1 Imbalance and mismatch

The transformation of the new retail model needs to be centered on the development and application of modern technologies such as big data and artificial intelligence, and the renewal of such modern technologies is often very frequent, which invariably increases the difficulty and cost of the transformation of traditional business models. However, due to the limited scale of operation of new retail, the difficulty and cost of transformation is not balanced by the scale of operation. Although the emergence of new retail has transformed the consumption concept of some consumers, most of them still maintain their inherent shopping channels, which are not compatible with the new retail formats.

3.1.2 Online and offline dilemma

At present, whether online or offline, the current new retail business model has fallen into a predicament. For online, with the development of e-commerce, the freshness of consumers for online shopping is declining, and the traffic dividend brought by the initial Internet has long since faded away; in addition, due to more online shopping choices, resulting in competition between merchants and merchants, platforms and platforms are also more intense, and the merchants and platforms have to spend more energy and costs to meet the needs of consumers. For offline, on the one hand, the development of e-commerce and the change of mobile payment means, gradually make the consumer's consumption habits changed, the customer offline purchase rate is low, merchants can't accurately perceive the consumer's demand; on the other hand, compared with online, offline need to pay more costs such as utility bills and rent. All these mean that, if new retail wants to develop and innovate, both online and offline channels must be better combined with modern technology and logistics.

3.1.3 Insufficient logistics support

Although many traditional e-commerce platforms already have a self-built logistics system. However, when consumers' shopping behavior is relatively more concentrated, there will still be beyond the carrying capacity of the logistics system outside the situation. Consumers' centralized shopping often leads to delayed receipt of goods and other phenomena in the logistics industry, which also reveals that there are still many deficiencies in the system construction of the entire logistics industry. Inability to meet consumer needs in a timely manner and provide strong support under the new retail business model.

3.2 Limitations of Low-Carbon Supply Chain Development under New Retail

3.2.1 Theoretical Differences of Low-Carbon Supply Chain

In today's era of globalization of supply chain, supply chain decarbonization can bring higher market competitiveness to enterprises. Unified theoretical knowledge of low carbon supply chain among all the cooperating parties in the supply chain is the precondition for the formulation of effective standards and objectives in the process of supply chain decarbonization. However, in reality, each link in the supply chain has different understanding of low-carbon supply chain and measures for supply chain decarbonization, and this difference in understanding will lead to the inability of supply chain members to coordinate effectively in the process of supply chain decarbonization, which hinders the process of supply chain decarbonization.

3.2.2 Restricted Choice of Green Integration Subject

In the process of supply chain decarbonization, only through the integration of internal and external organizations can the low carbon concept penetrate into all aspects of the supply chain system, and the selection of the appropriate integration body is the first task in the process of green integration. Under the traditional retail model, the supply chain network is relatively simple, and it is easy to coordinate the organization, so it is easier to find a suitable integration body. However, in the environment of the new retail business model, the green integration process not only has to face a more complex supply chain network, but also has to coordinate with more diversified partners to meet the differentiated needs of consumers.

3.2.3 Solidification of Production Mode and Consumption Behavior

Under the traditional business model, after the long-term influence of social and economic development, the production mode and consumption mode have gradually formed a relatively fixed pattern. First of all, the traditional production mode often

seeks to increase production with high energy consumption, while in the new retail business model, enterprises can take into account "low-carbon environmental protection" and "timely and efficient" with the help of digital technology. This paradigm shift often means greater implementation costs and upfront capital investment. Secondly, the introduction of low-carbon concepts has led to significant changes in packaging and logistics, which cannot be recognized by consumers in a short period of time. For example, McDonald's stopped providing plastic straws to customers in 2018; Apple removed chargers from its standard cell phone accessories by the end of 2020. These behaviors did not receive positive public opinion results.

3.2.4 Lack of Effective Carbon Emission Control and Monitoring Mechanisms

Transparency of the supply chain plays a crucial role in the process of supply chain decarbonization, and the lack of effective control and monitoring mechanism is an important factor leading to insufficient supply chain transparency. The supply chain network structure under the new retail model is complex, and each link needs to participate in the process of supply chain decarbonization. Inadequate carbon emission monitoring mechanism makes it impossible for the retail industry to accurately and effectively identify problems in the process of decarbonization of its supply chain, and monitor the carbon emission and carbon reduction level of its supply chain in the context of the "dual-carbon" target. This reduces their market competitiveness on the one hand, and makes it difficult to identify potential carbon reductions on the other, resulting in missed opportunities to reduce costs.

4. New Retail Supply Chain Innovation Strategy

4.1 Establish a Low-Carbon Supply Chain Concept and Strengthen Standardization Construction

Under the new retail business model, the establishment of low-carbon concept is decisive for the carbon reduction behavior of enterprises. Therefore, to truly realize the decarbonization of the supply chain, only if the concept of low-carbon supply chain is correctly established and deeply rooted in the people's mind, relevant enterprises will consciously take emission reduction measures when carrying out relevant activities. Only under the leadership of this concept can the development of new retail meet the requirements of society. In addition, to further develop the business model of new retail, it is necessary to strengthen the standardization construction through digital means, and only in this way can we better carry out green management in the subsequent work. In a nutshell, the low-carbon concept is the idea, while the construction of the standardization system is the standards and rules. New retail in the transition at the same time, both in the concept of the completion of the renewal of the low carbon awareness throughout the construction of the entire supply chain system. At the same time, in order to enable various subjects in the supply chain system to actively and effectively coordinate in the subsequent low-carbon links of the supply chain, it is necessary to formulate relevant industry standards and strengthen the construction of the standardization system. This is conducive to the unity and coordination of all links of the supply chain in the follow-up work.

4.2 Strengthening Internal and External Integration Links in the Supply Chain

Supply chain integration mainly involves two parts: internal integration and external integration. The internal integration of the supply chain mainly refers to the coordination and communication between various departments of the enterprises in the supply chain. In the process of integration, it is necessary to build an effective information sharing platform and information communication channels within the enterprise to improve the transparency of the whole supply chain. The external integration of the supply chain refers to the integration of the relationship between the upstream and downstream of the supply chain. In the new retail model, it is not only necessary to communicate with online platforms and offline physical stores at the same time, but also to coordinate the relationship with self-built logistics, which can effectively improve the controllability of the entire supply chain system. Through effective internal and external integration as well as strengthening internal and external links, effective information sharing can be realized, so that the carbon emissions and carbon footprints of each link have visibility. On the one hand, this visibility can facilitate enterprises in the supply chain system to find out potential low carbon links in the process of supply chain decarbonization; on the other hand, when problems occur in the process of decarbonization, it is convenient to find out which link has problems and correct them in time, and finally, it is also conducive to the strengthening of coordination and cooperation among the enterprises in the entire supply chain system in the process of decarbonization, so as to accurately and efficiently complete the process of decarbonization of the entire supply chain. The process of decarbonization of the whole supply chain can be completed accurately and efficiently.

4.3 Digitalization Drives Green Marketing

Digital technology is an important technical means to promote the decarbonization of the new retail supply chain, and it is also the main driving force. Firstly, through digital means, we can know timely and accurately the links in the supply

chain that can be optimized in a green way; secondly, the construction of digital platforms can improve the efficiency of information sharing and information coordination in the supply chain; lastly, the introduction of digital technology can also accurately and efficiently predict the market demand. These advantages can enable enterprises to successfully realize the green transformation of supply chain decarbonization while coping with market competition. At the same time, the application of relevant digital technology can also further improve the transparency of the supply chain and strengthen the supervision of carbon emissions and carbon footprint in the supply chain system.

4.4 Leading the Concept of Sustainable Consumption Scientifically

Enterprises should assume more social responsibility while strengthening market competitiveness and increasing revenue. Enterprises should guide consumers' consumption concepts to change through their own behavior. For example, enterprises should choose to favor low-carbon environmental protection commodity raw materials and production processes, on the one hand, to reduce environmental pollution, to achieve sustainable development. On the other hand, the follow-up through its marketing means, so that customers are more aware of each product from procurement to the final sales of all aspects of environmental protection measures, to guide consumers in the purchase of goods, can be more scientific choice of green products. Although this shift in a short period of time can not be effective, but in the long term, can make enterprises and consumers to reach a consensus between low-carbon environmental protection, and more conducive to enterprises in the completion of the supply chain of low-carbon goals at the same time to strengthen market competitiveness.

5. Conclusion

To sum up, China is currently in the context of the "dual-carbon" goal, and at the same time, with the emergence of various digital technology means, the new retail business model is also booming. The supply chain of the retail industry needs to take into account the low-carbon requirements of the general environment for its supply chain while meeting the development of the industry. However, there are still many limitations in the decarbonization of the supply chain of new retail in China. Therefore, the whole new retail industry needs to establish the concept of low-carbon supply chain and strengthen the standard construction. While the supply chain of new retail is well integrated with internal and external links, it should make reasonable use of digital technology to improve the transparency of the supply chain, timely and effectively supervise the carbon emission and carbon footprint in the supply chain, and discover potential improvement links. Finally, enterprises should take corresponding social responsibility and scientifically lead consumers to accept the concept of sustainable consumption. Only in this way can China's new retail industry flourish while promoting the development of domestic low-carbon supply chain.

Author Bio

Enming Wang (1998.01-), male, Han nationality, native of Changzhi, Shanxi Province, Master's degree student of Hubei University, research direction: operation management and supply chain management; Lei Xiao (1985.06-), female, Han nationality, native of Changsha, Hunan Province, associate professor,currently working at Hubei University, research direction: operation management and supply chain management.

References

[1] Fu, X, Q., 2024. Research on Quantitative Evaluation of Regional Carbon Emission Reduction Policy of China’s Yangtze River Delta Urban Agglomeration Towards the "Carbon Peak and Carbon Neutral" Goal. Science and Management, 1-16.

[2] Hong, Q, L., 2023. Green and Low-Carbon Transformation of China’s Industrial Chain and Supply Chain. Economic Review Journal, (09), 56-66.

[3] Jin, L.,Hao, G, S., 2018. Research on Pricing and Promotion Strategies of Online Retail Supply Chain Considering Socially Responsible. Soft Science, 32 (08), 106-111.

[4] Wang, S, C., Yu, J, J., Xuan, Z, N., 2020. A Literature Review and Prospect of“New Retail”in China. Science of Science and Management of S.& T., 41 (06), 91-107.

[5] Yi, L., Lu, Y., 2015. Study on Low-carbon Supply Chain Management: Current Research and Prospect of Developing Trends. China Management Science and Engineering Research Report . 7.

[6] Zhou, Y, W., Li, F., 2022. Problems and Challenges Faced by New Retail Operation Management. Journal of Systems & Management. 31 (06), 1041-1055.