

# Analysis and Research on Linkage Development between Dalian Port and Yingkou Port Based on Service Supply Chain under Big Data

Lina Fang <sup>a</sup>, Miaowang Zhong

Business Administration, University of Science and Technology Liaoning, Anshan, 114052 China.

<sup>a</sup>asfanglina@163.com

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## Abstract

The port is a window for the foreign exchange of a country or region. It is not only a hub connecting water and land transportation but also a distribution center for international trade. This article introduces the basic situation of Dalian Port and Yingkou Port, and then analyzes and expounds the problems faced by the two ports during the development process, it mainly discusses the cargo throughput, the hinterland economy, and the operation and management system; finally, it analyzes the direct competition between Dalian Port and Yingkou Port.

## Keywords

Big Data; Service Supply Chain; Linkage between Dalian Port and Yingkou Port.

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## 1. Introduction

With the in-depth development of economic globalization, the port management industry has become increasingly diversified, coupled with the development of modern information technology, the traditional management model has not been adapted to the requirements of the development of port enterprises, and supply chain management has begun to be introduced into the management of ports. There are numerous coastal ports in China, especially in the Bohai Rim region, where three regional port groups have been gathered. With the rapid development of the economy and the increasing number of international trade exchanges, the competition between ports has become more intense. With the acceleration of regional integration, competition has been upgraded from a single port to a competition between supply chains that port companies are involved in. At present, well-known ports at home and abroad have begun to plan and build their own port supply chain system, trying to occupy the initiative of competition through the strength of the group. Whether or not each node enterprise in the supply chain can cooperate and cooperate has become the key to the success of the port supply chain competition.

## 2. Research Background

After the end of the Second World War, all countries in the world began to commit themselves to the restoration of production and life. With the economic recovery, the scale of import and export trade between countries and countries has gradually exceeded the pre-war level. The economic and trade exchanges between various countries in the world have become increasingly frequent and close. The role of ports in the process of economic globalization has become increasingly important.

Traditionally, the port is a meeting point for various transportation modes such as land, sea and air. It plays a pivotal role in transportation. With the development of world economic integration, the

economies of various countries are no longer independent and self-sufficient, but the production and consumption of each other have been integrated together. International economic exchanges have become increasingly frequent and carry the vast majority of cargo transit ports. It has also been given a new mission.

In order to enhance competitiveness and take the initiative in international competition, coastal countries have stepped up their attention and efforts in port construction, and competition among ports has become increasingly fierce. Due to the scarcity of shoreline resources and the limited nature of the economic hinterland, how to make itself stand out in the fierce competition and gain greater economic benefits is a problem that is facing every port company.

### 3. Research Status of Port Supply Chain

#### (1). Foreign Research Status

As more companies begin to change their management models and shift from a production model to a market model, the company pays more attention to the comprehensive management and management. It not only pays attention to the optimization of the internal business, but also fully optimizes the company from the perspective of the "supply chain". The concept of chain management began to be introduced into the management of port companies, pointing to a new path for the port companies to regain their vitality.

With the increasing frequency of world economic exchanges, more and more scholars at home and abroad have begun to explore the role of port companies in the supply chain.

Ross Robinson (2002) pointed out that due to the rapid development of the supply chain where the port is located, the existing functions have been unable to meet the development needs of the port, but should regard the port as part of the value chain, and clearly define the division of customers and markets through value transfer. The port creates value for its own supply chain. The positioning of port companies in the new market competition should be an important driving component of the value chain [1]. Romano (2003) believes that the port is at the core of its own supply chain, and the development of the port has a decisive influence on the port supply chain. The PEST analysis method is mainly used to develop the environment of the port supply chain, and focuses on the study of the external environment [2]. Carbone V, De Martino M. (2003) proposes to change the role of the port in supply chain management [3]. Christopher. M (2005) believes that the economic activities of the port are often organized and implemented by relatively different players. It is a complex and dynamic entity, which leads to different operational, organizational, and strategic methods for the port system. At the same time, it highlighted the importance of port functions and the strategy of vertical integration and horizontal integration of ports [4]. Dong-wook Song, Photis M. Panayides (2007) and others believe that the development of contemporary logistics and shipping industry shows that the port includes various land and sea transportation methods and is an important node in the supply chain. It should play an important strategy role in the development of the shipping industry [5].

#### (2). Domestic Research Status

The fourth-generation port refers to physical space separation, but implements connection through common operations or management, this concept has laid the foundation of the port supply chain. Through the study of port function transformation, supply chain management characteristics, and new trends in port development, the academic community has put forward the concept of port supply chain and conducted more in-depth discussion and research. Sun Fengshan (2004) believes that port companies should respond quickly to changes in the market by strengthening the selection of supply chain nodes and the reorganization of logistics operations procedures. Partners can achieve mutual benefit and win-win, promote overall coordination of the supply chain, and enhance the port companies' The adaptability of a fiercely competitive environment [6]. Zhenhong proposed the concept of the fourth-generation port in 2005. Yang Mingming (2006) analyzed the characteristics of the port supply chain and introduced the operating model of the Hong Kong port supply chain [7]. Shi Lirong

(2007) has conducted a thorough analysis of the structure of the port supply chain and how to construct the port supply chain[8]. Yang Xiafang and Huang Junping (2007) analyzed the global supply chain management model centered on the port and put forward the idea of building Shanghai International Shipping Center through the idea of supply chain management[9]. Chen Huanbiao (2009) proposed four kinds of partnerships in the port supply chain and discussed the goals and steps for building a port supply chain[10]. Zhang Jieshu and Zhen Hong (2009) analyzed the three stages of the relationship between ports and supply chain, proposed the characteristics of the fourth generation of ports based on the idea of supply chain, and gave suggestions for development[11]. Li Jianli and Zhen Hong (2009) studied the relationship between ports and upstream and downstream enterprises, analyzed who should occupy the core position in the port supply chain, proposed the platform effect of the port, and proposed suggestions on how to build a port platform[12]. Lu Yongming (2009), by introducing the concept of coordination degree, constructed an index system for the coordinated evaluation of the port supply chain. Through the comparison of the horizontal and vertical coordination of a single port supply chain, the coordination trend and existing problems were analyzed to find out more coordination measure[13]. Shao Jing (2011) proposed a proposal for building a port supply chain by analyzing the problems in the development of Ningbo Port[14]. Wu Guozhong (2013) expounded the concept and connotation of the fourth-generation port and analyzed the cases with fourth-generation port concepts at home and abroad in order to sum up the significance of developing fourth-generation ports[15].

To sum up, the concept of the fourth-generation port has prompted port companies to introduce supply chain management into port operations and change the development trend of ports. Domestic and foreign scholars have studied and elaborated on the conceptual connotation and characteristics of the port supply chain, and studied how the upstream and downstream companies in the construction process of the port supply chain coordinate. However, most of the current research is limited to a single port, the reality is often that multiple ports will be gathered in a single area. There are fewer studies on how multiple ports in neighboring regions should develop under the supply chain concept and how to construct a port supply chain

#### **4. Development of Linkage between Dalian Port and Yingkou Port under Intense Competitive Harbor in Bohai Rim Region**

There are more than 60 large and small ports in the Bohai Rim region. According to the different administrative divisions of the ports, three major port groups have been formed, namely Liaoning Port Group, Tianjin Port Group and Shandong Port Group. The Liaoning coastal port group, which is one of the three largest port groups in the Bohai Rim region, mainly includes six major ports: Dalian Port, Yingkou Port, Jinzhou Port, Huludao Port, Dandong Port, and Panjin Port. Among them, Dalian Port and Yingkou Port are two hub ports in the port group of regional ports. Dalian Port is an important port for foreign trade in Northeast China, and Yingkou Port is one of the rapidly rising coastal ports in recent years. The rapid development of Yingkou Port should be a strong support for Dalian to build an international shipping center in Northeast Asia and consolidate its status as a hub port. Dalian Port and Yingkou Port should complement each other and develop together. However, the actual situation is that the two ports competed for the market and the source of goods and launched a price war, increasing investment in infrastructure construction, resulting in waste of resources and vicious competition between the two ports, not only The long-term development of Hong Kong and the entire coastal ports in Liaoning is unfavorable, and it also reduces the ability to compete with other ports in Bohai Bay. Tianjin Port and Qingdao Port in the Bohai Rim region are important trading ports in the north. Their port groups also have great interest in becoming an international shipping center in the north. Japan and South Korea's ports are also actively expanding their market share in Northeast Asia. All of these have exerted tremendous pressure on the development of coastal port groups in Liaoning. In the era of supply chain, are the two major port ports in Liaoning coastal port groups adhering to the

existing internal competition-based vicious competition development model, or are they choosing linkage coordination for rational planning and common development? For a foreseeable period of time, if we still do not change the development model and continue to adhere to this kind of internal friction competition model at the present stage, the two ports and even the entire coastal ports of Liaoning Province may be marginalized and lose their ability to compete with other ports. And the concept of building an international shipping center in Dalian will also be lost.

As two important nodes in the international logistics chain, Dalian Port and Yingkou Port must also be integrated into the supply chain. With the rapid development of ports in the region, the competition between ports has become more intense. At the same time, with the acceleration of the pace of rejuvenating the old industrial bases in Northeast and the construction of international shipping centers in Northeast Asia, the two ports will carry greater sea logistics.

## 5. Conclusion

The port is a central part of logistics and transportation, and occupies a very important position in the national economy. The level of port development has an important impact on the economic development of a region. As China's opening to the outside world continues to deepen, the status and role of the port is even more important. Under this background, in order to enhance their competitiveness, some port companies began to apply the supply chain theory to the operation and management of ports. In particular, the fourth-generation development stage of "combination ports" is established by linking ports in the physical space separated by ports. At present, the current research on port competitiveness mainly focuses on competitiveness evaluation research, the necessity of port competition and development, and research on competitive strategy selection based on mathematical models, and regards ports as a node in the supply chain. Under the background of supply chain strategy, less research has been conducted on port and shipping alliances between the ports and shipping companies, ports, and ports and the Hong Kong alliance. The adjacent ports in the region are placed under the supply chain. Research on how the ports should work together to enhance competitiveness under the supply chain ideology will help enrich the use of the supply chain theory to enhance the competitiveness of the port. While studying the evolution rule of the port generation and promoting the supply chain management, the significance of the joint development of the port lies in the new requirements of the economic integration on the development of the port, which will help the port to enhance its comprehensive competitiveness.

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