

World Maritime University

# The Maritime Commons: Digital Repository of the World Maritime University

---

World Maritime University Dissertations

Dissertations

---

8-25-2018

## How to reduce cost and increase efficiency of shipping enterprises in developing service supply chain

Junfeng Zhu

Follow this and additional works at: [https://commons.wmu.se/all\\_dissertations](https://commons.wmu.se/all_dissertations)



Part of the [Analysis Commons](#), [Marketing Commons](#), and the [Transportation Commons](#)

---

### Recommended Citation

Zhu, Junfeng, "How to reduce cost and increase efficiency of shipping enterprises in developing service supply chain" (2018). *World Maritime University Dissertations*. 1518.

[https://commons.wmu.se/all\\_dissertations/1518](https://commons.wmu.se/all_dissertations/1518)

This Dissertation is brought to you courtesy of Maritime Commons. Open Access items may be downloaded for non-commercial, fair use academic purposes. No items may be hosted on another server or web site without express written permission from the World Maritime University. For more information, please contact [library@wmu.se](mailto:library@wmu.se).

**World Maritime University**

Shanghai, China

**How to Reduce Cost and Increase Efficiency of  
Shipping Enterprises in Developing Service Supply  
Chain**

By

**Zhu JunfengW1701453**

**Supervisor:** Professor Liu Wei

**International Transport and Logistics**

## **Abstract**

In the past long period of time, the shipping industry was faced with the problem of excess capacity. Shipping companies must not find ways to reduce costs in order to achieve profitability. Among them, the most important methods are: directly reduce costs; through the development of service supply chain and technological innovation. In this paper, we analyze and compare the three methods of appeal using qualitative analysis methods such as Porter's five force model, PESTEL analysis and SWOT analysis. Through analysis and comparison, it can be concluded that the development of the shipping service supply chain is an inevitable trend, which can help shipping companies to significantly reduce costs and help shipping companies achieve new profit growth. In addition, the development of the shipping service supply chain requires technical support. Moreover, in order to gain a certain amount of time for the development of the service supply chain, shipping companies also need to find ways to directly reduce costs, such as the ship strategy. Through this dissertation, it can help shipping companies to correctly understand the urgency and necessity of developing a shipping service supply chain. At the same time, it must adhere to technological innovation in the process of developing the supply chain.

**Key words:** service supply chain; shipping; reduce cost; Porter's five force model; PESTEL analysis; SWOT analysis

## content

<b>1. Introduction</b> .....	1
<b>1.1 Background of this research</b> .....	1
<b>1.2 Literature review</b> .....	4
<b>1.3 The framework and content of the dissertation</b> .....	6
<b>1.4 Research methods and research purposes</b> .....	7
<b>2. Shipping enterprise developing service supply chain status quo</b> .....	9
<b>2.1 The composition and characteristics of shipping service supply chain</b> .....	9
<b>2.2 Status quo and development trend</b> .....	13
<b>2.3 How supply chain helps to reduce cost and increase efficiency</b> .....	15
<b>3. Analyze of the ways to reduce cost and increase efficiency</b> .....	19
<b>3.1 The way to reduce cost through internal</b> .....	19
<b>3.2 The way to reduce cost by developing shipping service supply chain</b> .....	24
<b>3.3 The way to reduce cost through technological innovation</b> .....	30
<b>4. How Maersk Line company develop service supply chain</b> .....	36
<b>4.1 Introduction of Maersk Line company</b> .....	36
<b>4.2 Analysis of Maersk Line company's service supply chain</b> .....	38
<b>4.3 Maersk Line's enlightenment to us</b> .....	41
<b>5. Summary and conclusion</b> .....	43
<b>5.1 Author's recommendation</b> .....	43
<b>5.2 Conclusion</b> .....	44
<b>5.3 Outlook</b> .....	45
<b>References</b> .....	46

# **1. Introduction**

## **1.1 Background of this research**

China's shipping logistics service supply chain system is still in its infancy, and it is trying to find a supply chain system that is in line with the development model of China's economic market. Although the shipping logistics service supply chain system is not mature, but it has begun to take shape and prototype. First of all, shipping logistics services, have been conscious of the joint between enterprises, the agents of goods, transport of goods, handling of goods and warehousing, etc., in an orderly manner together. However, this simple model is not enough to cope with the complex and volatile market environment. Therefore, it is necessary to optimize the shipping logistics supply chain and achieve a win-win situation for enterprises in every aspect of the supply chain.

With the development of the times and continuous improvement of science and technology, the market has become more and more volatile. Independent shipping companies have been unable to cope with the volatile market environment. Therefore, the shipping company must take some measures, such as the development of logistics services and derivatives business. In other words, shipping companies need to expand their business and reach deeper cooperation with port companies and third-party logistics companies. In the meantime, in recent years, due to overcapacity, the shipping market has become less prosperous, making the competition among shipping companies more and more intense. The competition among shipping companies is reflected in the competition in the logistics service supply chain. In addition, most shipping companies have won customers through cost cutting methods in the past period. This will create a vicious cycle that will lead to the development of service supply chain and find a new and benign way of competition. Develop service supply chain and explore synergetic mechanism among nodes in supply chain. Through the reorganization and optimization of business processes in the supply chain, intensive use of resources and full sharing to achieve synergies and obtain positive synergies. This is an effective solution to overcapacity.

The variability and complexity of the market economy environment pose enormous challenges to shipping logistics services. Because of the competitive relationship between

enterprises, gradually become the competition between supply chains. The shipping logistics service is the inevitable product of the development of the economic market. In order to improve the competitiveness of shipping logistics service supply chain and improve the efficiency and quality of shipping logistics service, it is imperative to optimize the cooperation of shipping logistics service supply chain. In addition, shipping companies also need to take a variety of ways to seek to occupy a larger market, hoping to achieve the goal of reducing costs and increasing efficiency. The basic framework model of the shipping logistics service supply chain is from functional suppliers to intermediate service integrators and finally to customers. The basic framework of all aspects, as well as detailed details, is the key to the need for collaborative optimization.

Shipping logistics service supply chain is mainly composed of goods suppliers, ports, customers and third-party logistics companies. Therefore, all enterprises should improve the closeness of activities between enterprises. First of all, they need to optimize business processes collaboratively among enterprises so as to strengthen the business interaction among enterprises to a certain extent. For product development, production and transportation, to jointly explore and participate in the entire logistics supply chain links, to help enhance the sense of responsibility among enterprises, and optimize the business processes, effectively improve the efficiency and simplify complex, More in line with the laws and requirements of economic and social development, but also more in line with the requirements of the market economy collaborative optimization of business processes. This article will study the innovation of shipping logistics supply chain and how to solve the problem of overcapacity by studying the cooperation mode and cooperation projects between shipping enterprises and third-party logistics enterprises and port enterprises.

Under the background of international shipping, Chinese shipping companies have their own advantages and disadvantages. The advantages are mainly reflected in the following: Firstly, China's rapid economic growth. The shipping industry has a close relationship with the macroeconomic situation, especially international trade. Since entering the 21st century, despite the impact of the international financial crisis, the Chinese economy has been in a period of rapid growth as a whole and the import and export trade has basically remained. A higher level of growth. The continuous growth of macroeconomics and import and

export trade has provided the Chinese shipping industry with a broad space for development and can provide effective support for the continued expansion of the shipping industry.

Second, the types of shipping companies are complete, and the scale of transport capacity has increased. With the development of the economy, Chinese shipping companies have mushroomed rapidly. They are mainly composed of a few large central shipping companies, some medium-sized companies, and a large number of small companies. All types of shipping companies can seek to meet their own development strategies based on their own strengths and characteristics and form a relatively stable dislocation competition. Chinese shipping companies have begun to integrate into the competitive environment of the global shipping market and have achieved remarkable results.

Third, China Shipping has many long-term and stable strategic cooperation customers. On the one hand, it establishes strategic alliances with core companies at home and abroad. With the deepening of the concept of modern logistics services for shipping companies, shipping companies are shifting from the role of “simple maritime carrier” to the role of “global logistics service provider”, providing customers with high quality and efficient integrated logistics services. On the other hand, investing in port terminals creates a logistics service base. By investing in ports, shipping companies can ensure that their transportation chains and logistics chains are not hindered, and they have priority use rights and control over terminals, lower operating costs, and improve ship operating efficiency and service quality.

Fourth, attach importance to the training of shipping talents. China has more than a dozen navigational colleges and universities that enjoy a good reputation both at home and abroad. It has trained a large number of marine-class senior seafarers and shipping management talents for Chinese shipping companies. At present, China has become the largest exporter of seafarers in the world. The overall quality of China's crew is high, and its business skills and professionalism are favored by many internationally renowned shipping companies.

At the same time, Chinese shipping companies also have their own disadvantages. For example, fierce competition in the industry, irrational structure of transport capacity, slow

development of integrated logistics, relatively weak management capabilities, and information construction are lagging. (China Ports, 2014)

China's shipping companies, especially small-scale shipping companies, are numerous. Except for a few central large-scale shipping enterprise groups, other shipping companies, especially inland rivers and coastal shipping companies, face fierce competition. The shipping capacity structure of China's international shipping companies is not reasonable enough. The specific performance is shown in the relatively high proportion of bulk carriers, fleet transportation capacity is small, the average age of vessels is high, and the size of container fleets is small. Although Chinese shipping companies have put forward the concept of “changing from traditional sea carriers to global logistics operators”, Chinese shipping companies have seriously affected the development of global integrated logistics services due to the lack of service networks all over the world. These are the status quo of domestic and foreign shipping companies, and they are also the background of this paper.

## **1.2 Literature review**

With the data from the countries along the maritime silk road, the GDPs, weights of industrial growth in GDP, and the survey on the origins of the wearing goods in three developed countries, the trends of accumulating manufacturing industries along the road are identified. Based on the theories of location quotient and product life cycle, 20 countries along the Road are investigated and those with potential to accept the manufacturing industries are identified, which provides a theoretical basis for moving the manufacturing industries from other areas to the countries along the Road. (Huang Ruishuo, 2017) The future trends of port and ocean shipping are projected and some strategies for encouraging the shipping logistics industry and manufacturing industry in the context of 21st-century maritime silk road are proposed.

This study empirically examines the relationships between internal green practices, external green integration, green performance, and firm competitiveness in the container shipping context. We collect data from a survey of 163 container shipping firms in Taiwan



and apply a structural equation model (SEM) to test the research hypotheses. We confirm that internal green practices and external green collaboration have positive impacts on green performance, which in turn helps to enhance firm competitiveness. The findings show that a firm green performance and external green collaboration act as mediator variables between internal green practices and firm competitiveness, and they influence firm competitiveness positively. We also discuss in this paper the managerial implications for container shipping firms to improve their green performance and competitiveness. (World Shipping Council, 2018)

The basic framework model of the shipping logistics service supply chain is from functional suppliers to intermediate service integrators and finally to customers. The basic framework of all aspects, as well as detailed details, is the key to the need for collaborative optimization. First of all, based on the shipping logistics services, functional service providers are optimized, including shipping companies, ports, agents, warehousing enterprises and other related service agencies, all of which are the basis for optimizing shipping logistics services. Need to clear the supplier's customer goals and production of goods for state-owned enterprises or private enterprises, and specific business characteristics of the use of different supply chain; the same time, third-party logistics companies and ports are shipping logistics services Therefore, different shipping modes, such as aviation and navigation, should be prepared according to the different characteristics of the goods. Third-party logistics is required to provide supporting services to ensure the optimization of the shipping logistics service supply chain framework. (DR Quintana, 2016)

In the era of knowledge economy, the pace of international economic globalization is getting faster and faster. The development of economic globalization and the emergence of a large number of multinational corporations have promoted the rapid development of international trade and made the development of international logistics a sustained, healthy and rapid development of the world economy an important part. The core of international logistics is international transportation. The center of international transportation is shipping. The development of international logistics makes the research on international logistics, especially the study of shipping, which is the main mode of transportation of

international logistics. This has prompted major shipping companies of all countries in the world to concentrate their efforts on key links such as land transport, maritime transport, air transport, warehousing and information circulation and integrate their shipping logistics systems to study how shipping and logistics phases Combine and create a unique and efficient integrated logistics system for the shipping industry to develop into modern integrated logistics in order to gain a competitive advantage and gain a foothold in the increasingly competitive shipping market to seize the market and make profits. (Huang Ruishuo, 2017)

These literatures introduce the development background, research status and major development trends of the shipping service supply chain. Of course, as far as the service supply chain is concerned, the development status at home and abroad is quite different. Although the shipping industry is an international business and covers a large number of countries, most companies do not only have domestic businesses. This information can help analyze the impact of the shipping service supply chain on shipping companies. In addition, some scholars have conducted in-depth research on the service supply chain, which can help comparative analysis.

### **1.3 The framework and content of the dissertation**

The establishment of a shipping logistics service supply chain is a general trend. Under the background of the continuous excess capacity in the shipping market, how to achieve the objective of cost reduction and efficiency increase through the establishment of a good shipping logistics service supply chain becomes even more important.

The first part mainly explains the background of the thesis topic, as well as some concepts. In the second part, this paper introduces the composition and characteristics of the shipping service supply chain, the status quo and the development trend, and how the shipping service supply chain realizes cost reduction and efficiency increase. In the third section, three methods will be introduced to reduce costs and increase efficiency, which will be analyzed using the Pestle analysis, Porter's five-force model and SWOT. In the fourth part, a shipping company will be found to analyze it. The introduction of the Maersk case was

mainly for the purpose of combining with the third part to help compare the three methods. At the same time, with Maersk's practice, it can help the paper reach a conclusion. The fifth part gives suggestions on what methods shipping companies can use to reduce costs and increase efficiency in the context of excess capacity.

The main purpose of this paper is to study whether the development of shipping service supply chain by shipping companies is a better way to help shipping companies realize cost reduction and efficiency increase through comparative analysis. Moreover, at the end of the article, it will give the suggestion to the shipping enterprises about what is the attitude towards the development of the shipping service supply chain, during the exploration of the cost reduction and efficiency improving approaches.

#### **1.4 Research methods and research purposes**

There are mainly three ways for shipping companies to realize cost reduction and efficiency increase. First, directly reduce costs, that is, carry out reforms within the company, continue to fight price wars, and obtain more markets at lower cost. The second method is that the shipping company and the port company have already cooperated with the third-party logistics company and reorganized it to establish a shipping service supply chain and reduce costs and increase efficiency through the supply chain. The third method is to reduce costs and increase efficiency through technological innovation.

This article will use three research methods, one is Porter's five force model, the other is pestel analysis, and the third is swot analysis. With these three models, the three methods of cost reduction and efficiency increase are analyzed and compared to see if there is any advantage in developing a shipping service supply chain. The five-force analysis model was proposed by Michael Porter in the early 1980s and has a global and profound impact on corporate strategy development. Analysis for competitive strategy can effectively analyze the customer's competitive environment. Five forces are: The bargaining power of the supplier, the bargaining power of the buyer, threat of new entrants, substitutes, rivalry. The different combinations of the five forces ultimately affect the change in the industry's profit potential. (MBAlib, 2018)

The PESTEL analysis model, also known as macro-environment analysis, is an effective tool for analyzing the macro-environment. It can not only analyze the external environment, but also identify all forces that have an impact on the organization. It is a method of investigating external influence factors of an organization. Each letter represents a factor and can be divided into six major factors: Political, Economic, Social, Technological, Environmental and legal factors. (Baiké, 2018).

The SWOT analysis method, that is, situation analysis method, is to list all kinds of major internal advantages, disadvantages, and external opportunities and threats that are closely related to the research subjects, and to list them through surveys and arrange them according to a matrix, and then use system analysis. The various factors are matched with each other and analyzed, from which a series of corresponding conclusions are drawn, and the conclusions usually have a certain degree of decision-making.

Using this method, we can conduct a comprehensive, systematic, and accurate study of the research object's situation, and formulate corresponding development strategies, plans, and countermeasures based on the research results. (Baiké, 2018) SWOT analysis is often used to formulate group development strategies and analyze competitors. It is one of the most commonly used methods in strategic analysis.

Through three different models, it is possible to analyze and compare the three ways to reduce costs and increase efficiency, to conclude that it is necessary to develop a shipping service supply chain. It can also be concluded that the advantages and disadvantages of the three methods are to help shipping companies gain more profits in the context of excess capacity.

## **2. Shipping enterprise developing service supply chain status quo**

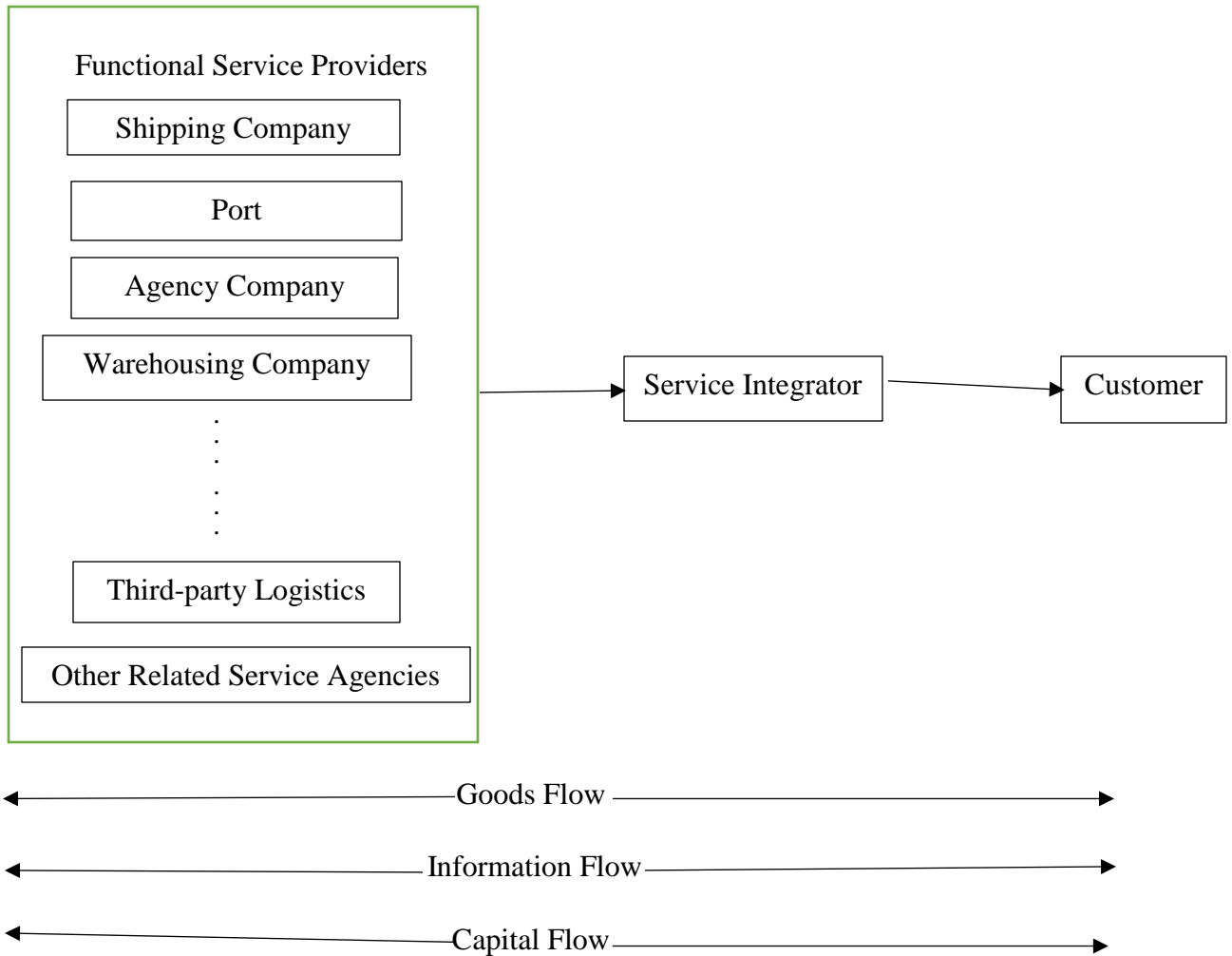
### **2.1 The composition and characteristics of shipping service supply chain**

Service supply chain is an integrated supply chain led by service demand. This view inherits the concept of customer-centricity in supply chain thinking and believes that the management and operation of service supply chain is driven by service demand. The shipping and logistics industry provides various services such as agency, customs declaration and inspection, water transportation, loading and unloading, warehousing, and information. The shipping logistics service supply chain is a coalition formed by companies providing these services for resource integration and service integration.

Specifically, the shipping logistics service supply chain refers to the core business of shipping logistics, and the integrated logistics service provider provides functional services to ports, shipping companies, agency companies, warehousing companies, third-party logistics companies, and trading companies. Logistics service providers, as well as relevant government regulatory agencies, banks, insurance and other organizations for effective integration, through the control of logistics generated in the service, capital flow, to provide integrated services to customers, to better meet the needs of customers, functional network structure.

The quality of supply chain operations is mainly determined by the management capabilities of integrated logistics service providers (i.e. service integrators). The work of service integrators in the shipping logistics service supply chain may be undertaken by port companies, shipping companies or third-party logistics companies, or may be undertaken by a functional service provider, they can establish a dedicate operation and management department to undertake, in addition, the forth party logistics company which is independent of the supply chain can undertake.

Combining the specific meanings of the shipping logistics service supply chain, we can draw a framework model of the shipping logistics service supply chain, that is functional service provider, service integrator and customer. The specific model is shown in Figure 1.

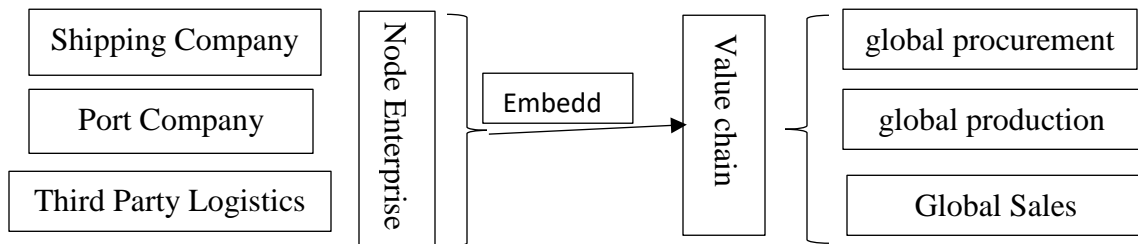


As can be seen from the framework model, the shipping logistics service supply chain is mainly driven by customer needs and is a chain structure composed of functional service providers, service integrators and customers. In this chained structure, the customer is the service object of the supply chain. Since the shipping logistics service supply chain is based on shipping logistics, and the shipping logistics service is an important part of international trade, therefore, the service object of the supply chain is mainly international manufacturing. Business, retailers and traders. The service integrators in the framework decompose service requirements and are completed by service providers of functional service providers (ie, shipping logistics service supply chains).

The key companies that constitute the shipping logistics service supply chain mainly include shipping-based shipping companies, port-based port companies, and third-party logistics companies that provide supporting services. The basic service function provided

by shipping companies is water transport. The basic service function of port companies is goods handling. Third-party logistics mainly provides related services related to shipping. Port companies need to provide services for shipping companies, and third-party logistics services for shipping companies and ports at the same time. Therefore, shipping companies want to reduce costs and increase efficiency, they need to strengthen the cooperation between these three nodes.

Port companies, shipping companies, warehousing companies, agency companies, and third-party logistics companies are not only the nodes of the shipping supply chain, but also the embedded points of the shipping supply chain embedded in the global value chain (excluding government service agencies). The shipping supply chain is embedded in the node embedded mode. Global value chain. From the perspective of service demand, when a company on the global value chain puts forward a demand for productive services, the service provider companies embedded in the nodes will respond immediately. The information flow will form a feedback within the supply chain. The integrators will drive the supply chain. Rapid response, providing customers with a total solution including but not limited to cargo flow and capital flow, and ultimately achieving services (see Figure 2). At this time, it is not the service of a certain supplier company but the "chain service" provided by the shipping supply chain.



The efficiency of "chain service" depends on the degree of integration within the supply chain and the speed of response. At the same time, the choice of different embedded points, like external interfaces, is also crucial. Transport-oriented shipping companies, port-based port companies, and third-party logistics companies that provide related services are not only the three key nodes of the shipping supply chain, but also the key embedded points of the shipping supply chain embedded in the global value chain. When shipping companies,

port companies, and third-party logistics companies are embedded in the value chain as supply chains, the supply chain's integration level and response speed have been greatly improved due to the shortened supply chain response distance and its mature core business capabilities. So that the advantages of "chain service" can be brought into full play.

Faced with the opportunities and challenges brought about by the global industrial division of labor and industrial upgrading, shipping companies should actively adapt to changes in production and adopt a shipping supply chain approach to embed global value chains. In other words, the shipping industry should serve the global value chain in a "chain service" rather than a single enterprise. At the same time, the competition among shipping companies also turns from the competition between enterprises and enterprises to the competition between supply chains and supply chains. In addition, the shipping supply chain has more obvious features than other supply chains.

First of all, the seven characteristics of the supply chain need to be introduced. First, proactive use of big data, the supply chain needs the support of big data, and supply chain managers need to use big data to efficiently handle business. Among them, the most important point is that you need to use big data to predict inventory. Second, inventory optimization. The more accurate the inventory management needs to be, the better it is to analyze and predict based on the available data. At the same time, inventory optimization also includes how to make timely adjustments to inventory after unexpected events occur. Third, flexibility, with the increasing globalization, there will be more and more collaborators joining the existing supply chain system, which leads to a very practical problem "how will more orders be fulfilled at today's pace?". Flexibility means that the supply chain must adapt to changes in the market environment, political environment and other factors that will occur in the future. (Amber.M, 2015)

Fourth, rapid fulfillment, the customer's orders are changeable. The supply chain must combine multiple modes of transportation to deal with different orders and changing markets. Orders are quickly met, even if there are some unexpected events. At the same time, products can be tracked. Fifth, customization, which refers to how unique supply chain processes are implemented throughout the supply chain to provide consumers with what they want. Sixth, sustainability will be a driving force in a best in class supply chain.



The last, compliance and visibility, and perhaps it is the most significant. Basically, this equates to the way self-assessment and supply chain process monitoring, which leads to higher compliance. (Amber.M, 2015)

The shipping supply chain not only has features common to the ordinary supply chain, but also has other characteristics: (1) Makes the company's production-centered production less, while customer-centric services increase, adding new services. Added value and corporate profits; (2) Changed the competition format, the competition between the ship and the ship is changed to the competition between the chain and the chain; (3) Provides the opportunity and space for the collaborative innovation with the manufacturing enterprise. (Yanqiu.Lu, 2015)

## **2.2 Status quo and development trend**

China's shipping logistics service supply chain system is still in its immature stage, and it is exploring and creating a supply chain system that conforms to the development model of China's economic market. Although the shipping logistics service supply chain system is not mature, it has begun to take shape and shape. First of all, the shipping logistics service has already consciously linked companies together, orderly linked to the agency of goods, the transportation of goods, the handling of goods, and the storage of goods. However, this simple model is not enough to cope with the complicated and changing market environment. (Huang Ruishuo, 2017). Therefore, it is necessary to optimize the shipping logistics supply chain and achieve a win-win situation for enterprises that are in all aspects of the supply chain.

At present, the development of China's supply chain management must be lagging. It lags foreign countries and even several decades. Most of supply chain management education is generalized management knowledge education. Realizing the integration of supply chain through Internet technology, improving the response speed of the whole supply chain through the information transparency between the upstream and downstream of the supply chain, and thus maximizing the benefits are the urgent issues for current research and study

in theory and practice. There are several major problems in the supply chain of shipping companies in China.

NO.1 Shipping companies are not really aware of the impact of the supply chain concept.

At present, China's shipping companies have insufficient understanding of the importance of being involved in the TPL industry. They have not paid enough attention and blindly entered and have not found a suitable entry point. This has resulted in a passive business and has not yet brought into full play the advantages of the international liner companies. Businesses failed to highlight their own specialty and service features, and this is precisely the most important.

NO.2 Different service methods cannot be mutually recognized among enterprises

In addition to the need for a smooth logistics mechanism among supply chain alliance companies. There is also a need for matching quality service flows. The service flow relies more on the quality of the internal staff of the company. Different service methods cannot mutually recognize each other in the enterprise, making the service flow more difficult to be connected, resulting in business process conflicts.

NO.3 Most of the shipping companies in China are extremely lacking in supply chain management personnel, and this has caused many problems for the company's business decision-making.

According to the status of logistics supply chain, shipping companies have their own supply chain optimization strategies.

1. Enterprises must strengthen the concept of supply chain management. This includes not only the introduction of advanced management systems, strategies and technologies, but also the introduction of talents, and the strengthening of staff education and training.
2. Strengthen the information construction. Shipping companies should establish databases to provide possibilities for recording and monitoring the supply chain; improve computer networks and realize supply chain information sharing; develop

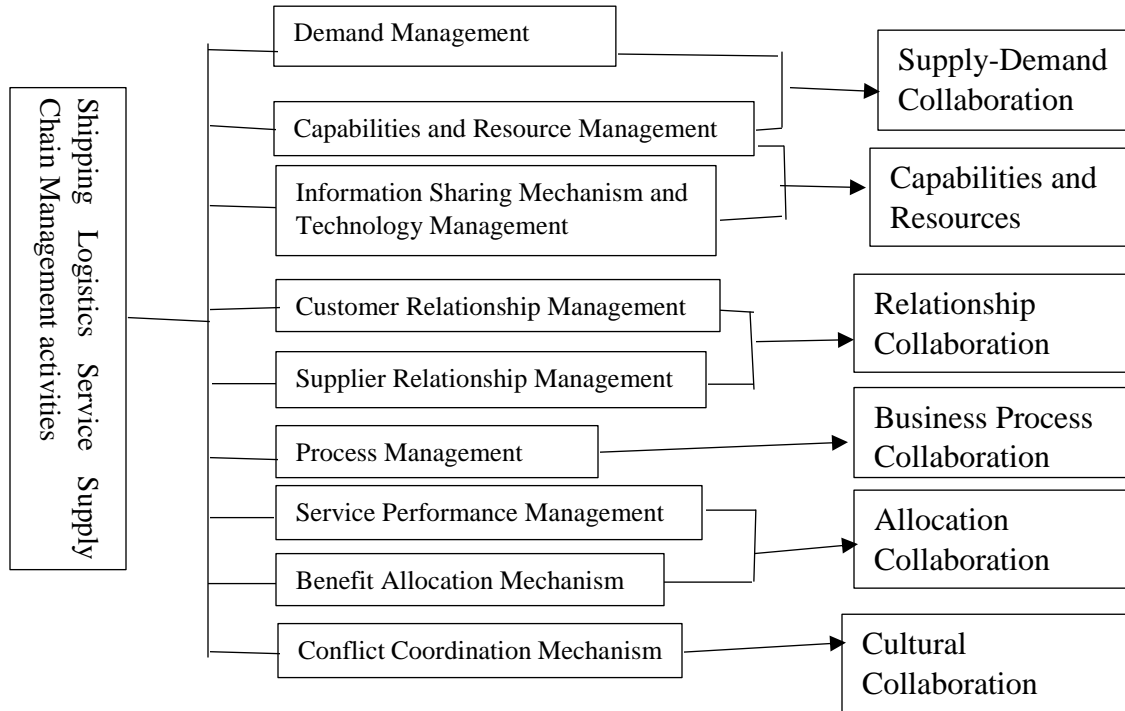
data analysis and artificial intelligence to help supply chain managers make timely and correct decisions.

3. Integration of resources. From the successful transformation of the water carrier to the logistics operator, the shipping company cannot passively guide the development of the enterprise from the external environment, and it must generate internal driving forces.
4. The shipping business must adapt to the continuous changes in the market. Through restructuring and integration, it will help reduce costs, increase operating efficiency, and further increase market share. In addition to information systems, supply chain management also integrates workflow, physical processes, funding processes, and information processes for overall optimization. Improve efficiency in the procurement, transportation, storage and sales processes, and optimize all aspects of the supply chain.
5. Implement joint. Looking at the development of the shipping industry and the logistics industry in the world, it is full of joint, merger, reorganization and other forms. The alliance with the shipping companies can effectively reduce the company's operating costs, improve the utilization of space, speed up the flow of goods, provide customers with more timely and accurate services, and speed up the flow of funds for customers. Bring the benefit of related parties. (Yan Yang, 2009).

### **2.3 How supply chain helps to reduce cost and increase efficiency**

To reduce costs and increase efficiency is something that every company pursues, whether it is manufacturing or logistics. According to the research of Accenture, an internationally renowned consulting company, through the implementation of supply chain management, transportation costs can be reduced by 5%-15%, operating costs of the entire supply chain can be reduced by 10%-25%, the company's order processing cycle can be shortened by 35%, and inventory can be reduced by 10%- 30%, shorten the cash cycle by about 20%. Xu Guanju said that the supply chain is the bridge linking supply and demand, directly affecting the adaptability of supply to demand, and it is a deepening structural reform on the supply side, promoting the sustained and healthy development of China's real economy,

and especially an important entry points and breakthroughs to improve the competitiveness of the manufacturing industry.



As can be seen from the table, shipping logistics service supply chain management activities are mainly divided into nine. They are requirements management, capability and resource management, information sharing mechanism and technology management, customer relationship management, supplier relationship management, process management, service performance management, benefit distribution mechanism and conflict coordination mechanism. The coordination between these nine parts is the focus of shipping supply chain management. The synergy between them is divided into six. They are supply and demand coordination, capability and resource coordination, relationship coordination, business process collaboration, distribution coordination, and cultural collaboration.

### 1. Supply and Demand Coordination

Through the forecast of shipping logistics service demand, the overall service needs of the shipping logistics service supply chain or various functional service requirements are

determined to provide corresponding service capabilities. Supply-demand collaboration can provide the basis for capacity and resource planning.

## 2. Capability and Resource Coordination

Can be divided into horizontal and vertical collaboration. Horizontal coordination refers to the coordination of resource allocation between ports and ports, between shipping companies and shipping companies, and between third-party logistics companies and third-party logistics companies. (Lu Zhang, 2017) Vertical coordination refers to the resource allocation agreement among the ports, shipping companies, and third-party logistics companies.

## 3. Relationship Coordination

The relationship coordination mainly coordinates the relationship between ports and shipping companies and other companies, customers, ports, shipping companies, and third-party logistics companies in the shipping logistics service supply chain and strengthens their mutual trust.

## 4. Business Process Collaboration

Business process coordination mainly coordinates the supply chain business process that is composed of the business activities of node companies such as ports, shipping companies, and third-party logistics companies. In order to make the business activities of each node company closer, the process efficiency is improved.

## 5. Distribution Coordination

Allocation coordination can maintain fairness among the nodes of the shipping logistics service supply chain, coordinate and balance the risks and benefits of the ports, shipping companies, and third-party logistics companies in the supply chain.

## 6. Cultural Collaboration.

Objectively existing cultural differences are prone to conflict in supply chain management and hinder the coordination of shipping logistics service supply chain. Therefore, cultural

synergy is an indispensable content for the coordination of shipping logistics service supply chain. (Rongyan Zhu, 2014)

It is precisely because of these synergies in the shipping service supply chain that they can effectively allocate and use resources and can achieve the goal of cost reduction and efficiency gains in the context of excess capacity. In addition, in the collaborative relationship of shipping service supply chain, how to regulate shipping companies, port companies, and third-party logistics companies has been referred to many times and has a very important position. Therefore, to achieve the goal of reducing costs and increasing efficiency, we must properly handle the relationship between the three.

### **3. Analyze of the ways to reduce cost and increase efficiency**

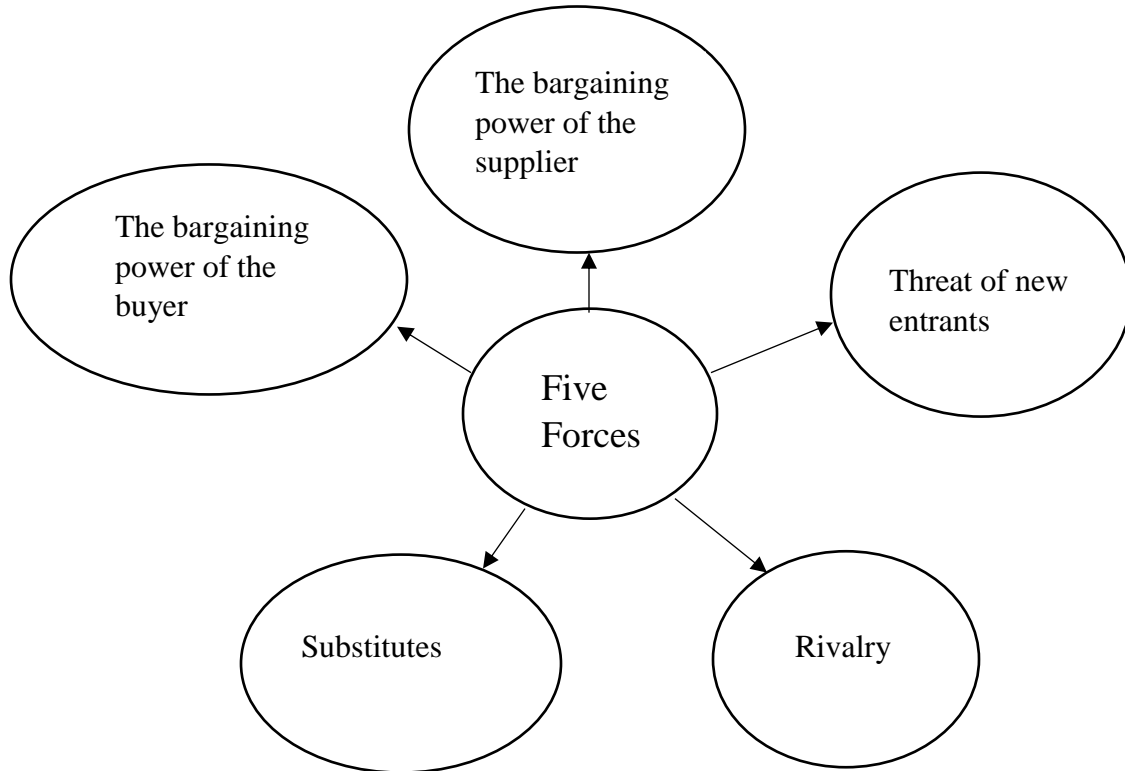
#### **3.1 The way to reduce cost through internal**

There are many ways to directly reduce costs, but now the most widely used method in the shipping market is the "big ship strategy." Its main objective is to upgrade its capacity, including the installation of new ball noses and new propellers, in order to reduce the speed of ships and reduce the cost of fuel. Under the background of the persistently low international oil prices, it is strategic to reduce fuel costs. Maersk and other shipping giants can reduce operating costs and maximize the economic benefits of economies of scale by renovating existing shipping capacity. On the other hand, shipping giants can consolidate their market position and enhance the competitiveness of their own shipping alliances. In the face of the slowdown in the growth of global trade and the lack of demand in the shipping market, shipping companies are trying to find solutions.

By speeding up the scrapping of aging ships to reduce excess capacity and offset some of the new shipbuilding deliveries, the net growth of capacity is maintained at a low level and the volatility of the shipping market is reduced. According to statistics, there will be 1,000 ships to be dismantled in 2016 with a total capacity of 52 million tons. A number of international shipping giants have phased out boats with capacity of 3000~5000TEU and tend to use large ships. For our country, as early as December 2013, the Ministry of Transport, the Ministry of Finance, the National Development and Reform Commission, the Ministry of Industry and Information Technology and other four ministries and commissions issued the "Implementation Plan for the Advance Scrap Renewal of Old Shipping Vessels and Single Hull Oil Tankers". Encouraging the retirement of old ships in advance, domestic shipping companies have accelerated the scrapping speed of old ships under policy guidance and government subsidies, and the volume of dismantling in 2015 has set a new historical record, accounting for 30% of the total global dismantling. However, the capacity of the container market is still developing. (Liewei, 2016). It is not possible to fundamentally solve the problem of overcapacity by simply shortening the service time of ships and accelerating the elimination of old ships. In view of the shipbuilding volume and order volume in recent years, when the global trade market

shrinks, the shipping industry still has a large number of new transport ships waiting to go to sea.

### Michael Porter five forces model



**The bargaining power of the supplier:** The shipping companies must reduce their costs directly within the company and must have strong supplier bargaining power. This means that the shipping companies occupy a more powerful position in the bargaining process. Among the shipping companies, the main suppliers are: shipyards that provide shipping capacity; enterprises that provide ship fuel; and port and shipping companies that operate port berths and terminal operations. However, because of the special nature of the shipping industry, the general shipping companies and their suppliers have signed long-term and rigid supply contracts. In general, although shipping companies have a favorable position in the bargaining process of suppliers, the advantages are not obvious. Therefore, in the direct cost-reduction method, the price range that depresses the supplier is limited, and cannot be kept down. Because of the existence of long-term contracts, prices may not fluctuate for some time.



**The bargaining power of the buyer:** In the context of a market with excess capacity, the bargaining power of shipping companies and their customers is relatively weak. From economics, the current shipping market is a buyer's market. The ultimate goal of cost reduction and efficiency increase is to maintain existing customers and develop potential customers in order to achieve profitability. The direct cost reduction method can only help the company to make up for the disadvantages in the process of customer bargaining and cannot obtain a better position.

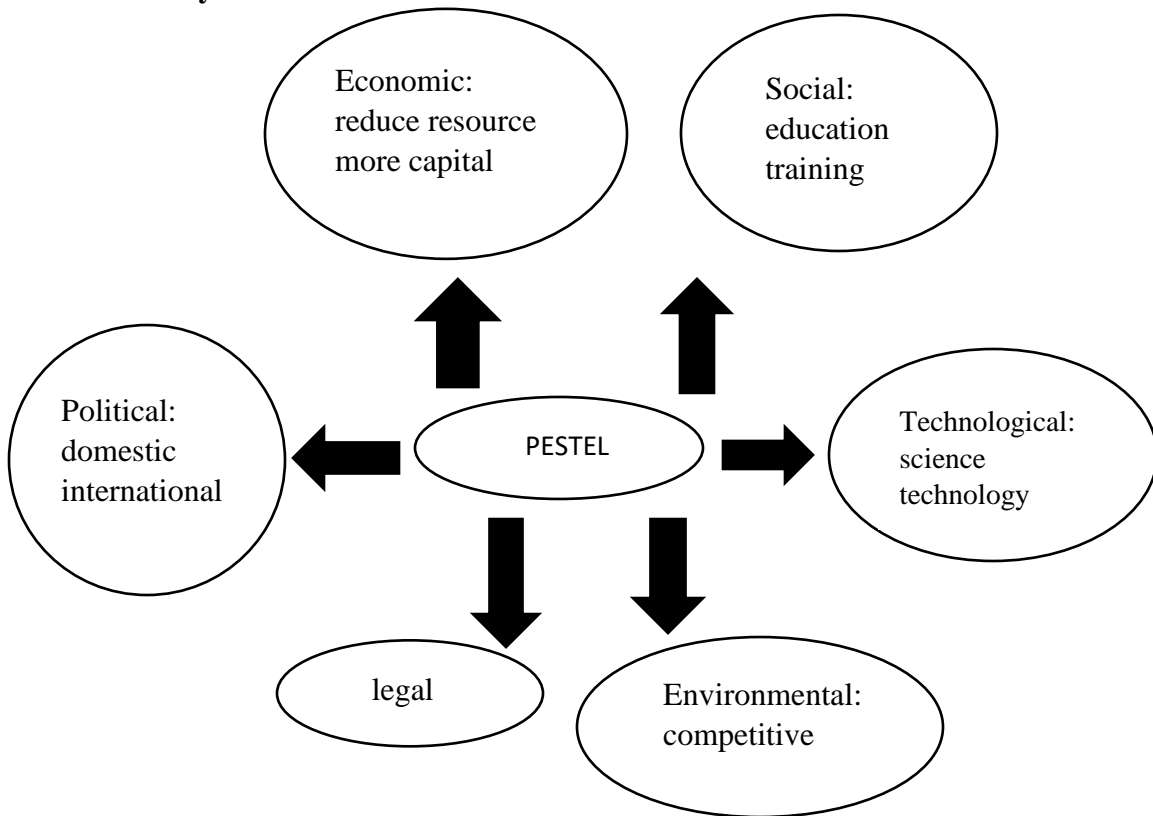
**Threat of new entrants:** Using this method to reduce costs and increase efficiency poses greater risks to potential entrants. It is mainly manifested in the fact that the strategy of a large ship is not a company's strategy, but an entire industry's development prospects. Companies in the same industry are also seeking new ways to reduce costs.

**Substitutes:** Whether it is a large ship strategy or speeding up the elimination of old ships, it is difficult to find alternatives. At least in the existing tools, it has not been able to replace the big ship. Of course, as technology advances, alternatives will inevitably emerge. However, some other methods that can reduce shipping costs can also be called substitutes. Therefore, there are fewer threats in this area.

**Rivalry:** Because of the excess capacity and the sluggish shipping market, the competition between shipping companies is fierce. Various shipping companies are looking for ways to reduce costs. Shipping companies are racking their brains in price wars. At the same time, they also hope to find other ways to earn profits. In general, competition cannot be avoided, and the competition is very fierce. Directly reducing costs can only make the competition intensify, which is detrimental to the entire industry.

Through the above analysis, it can be concluded that the method of directly reducing costs is relatively high in all aspects. Especially when it comes to customer bargaining, it is very passive. At the same time, reducing costs directly is limited. In addition, this method can only ease the status quo of shipping companies, but it cannot be solved in the long run. That is, it can only reduce the cost, and it is less helpful to increase efficiency.

## PESTEL analysis



**Political:** As stated in the above articles, our government has introduced some policies to help our shipping companies reduce costs and increase efficiency to occupy an advantageous position in the international market. However, because the shipping market is an international market, policies vary from country to country. Internationally, the "big boat strategy" and the acceleration of the elimination of old ships are the general trend.

**Economic:** From the economic point of view, it is necessary to separate the big ship strategy from the accelerated elimination of old ones. The ship strategy can reduce unit fuel consumption, reduce operating costs, and maximize the economic benefits of economies of scale. At the same time, it requires additional investment in shipbuilding, including both capital investment and human, material, and capital investment. At the same time, accelerating the elimination of old ships can quickly recover some useful resources. The energy consumption of old ships is much larger than that of new ones and can effectively resolve the problem of transport capacity.

**Social:** The development of large-scale ships is a trend, and it is also a solution for shipping companies to reduce costs and improve transport capacity. Of course, the implementation of this strategy requires a lot of excellent talents to support it.

**Technological:** Advances in equipment will inevitably require advances in science and technology. The construction of a large ship requires technology to be tilted, but because the ship's large scale is not a process from scratch, the technical problems encountered are relatively few.

**Environmental:** The market environment is rather harsh because the industry is very competitive. The continuous reduction of shipping companies' costs will only make the shipping market more competitive. Directly reducing costs cannot fundamentally solve the problem of excess capacity.

**Legal:** There is no legislation in the international market, and only some regulatory clauses may come out in each specific international.

Through the PESTEL analysis, it can be concluded that the direct cost reduction method encountered in the implementation of the process is still less, as long as overcome some technical and economic difficulties can be. Therefore, in implementing this method, it should be relatively smooth. Then use SWOT analysis to see what happened after the implementation.

**SWOT analysis**

Strengths	Weaknesses
1.Fast results: Relatively satisfactory results can be achieved in a shorter period. 2.Good control: Basically, all factors are controllable and many risks can be avoided. 3.Environmentally friendly: Recycling resources; reducing energy consumption and emissions.	1.Cannot fundamentally solve the problem, but may increase competition 2.Can't reduce costs infinitely 3.The cost reduction is very small 4. Blindly reducing costs will also bring security risks. This is complementary. Because too much attention is paid to cost, it will certainly require other aspects of

	sacrifice. This sacrifice is likely to be a sacrifice in security. 5. The shortcomings of the shipping enterprise management system still exist.
Opportunities	Threats
1.As technology advances, costs may decrease further 2.The emergence of super-large vessels has a different meaning for the shipping market 3.Can help shipping companies alleviate the problem of excess capacity	1.Big competition pressure between different shipping companies 2.If the order is reduced, the big ship will become unusable and even cause losses 3.When there are other more effective ways to solve excess capacity, the advantages of the big ship strategy will not be obvious.

As far as the SWOT analysis is concerned, although the advantages are obvious, there are many weaknesses and threats. After the implementation, it is very important to avoid these weaknesses and threats. Perhaps the second approach to the afternoon can help overcome these weaknesses and threats and help shipping companies achieve cost reductions and efficiency gains.

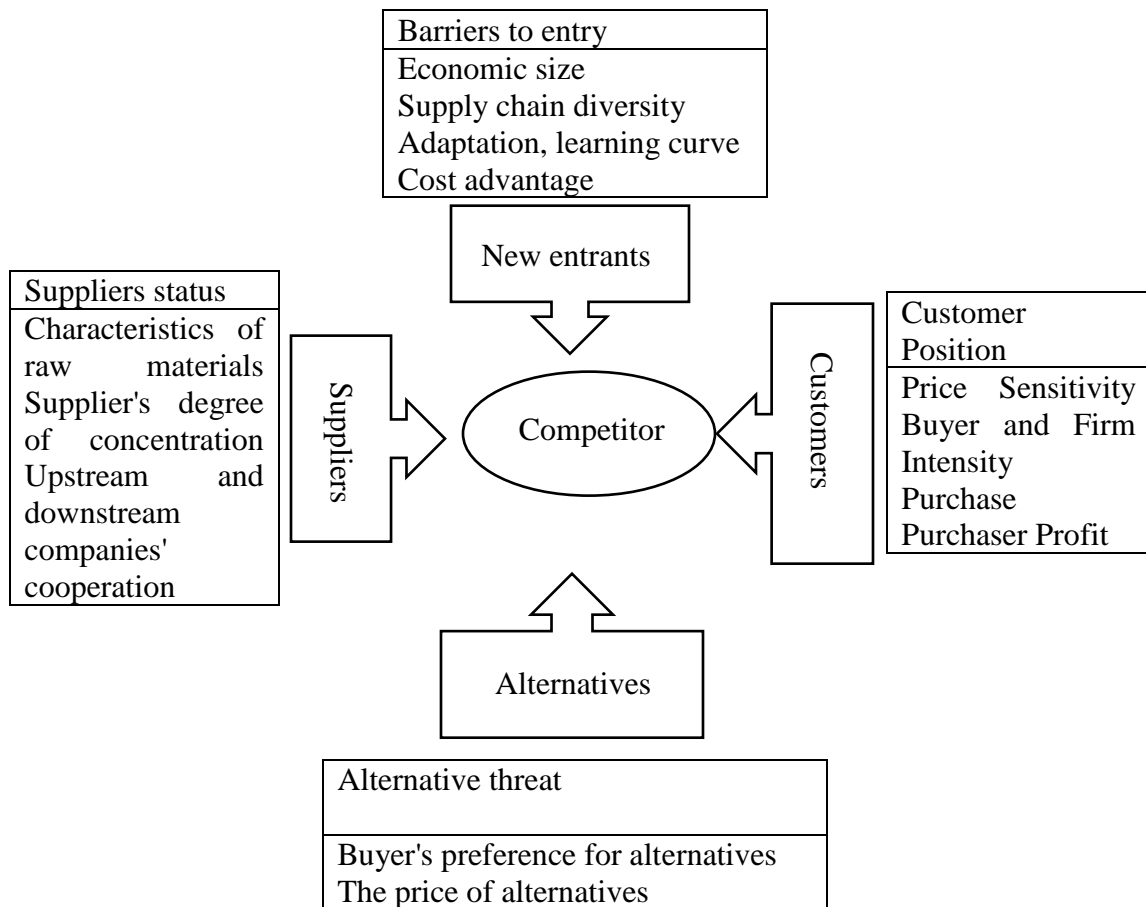
### **3.2 The way to reduce cost by developing shipping service supply chain**

The shipping logistics service supply chain is mainly composed of port chain enterprises formed by port companies, shipping companies, warehousing companies, third-party logistics companies, and port authorities, among which the ports, shipping companies, and third-party logistics companies are the main nodes of the supply chain.

Therefore, in the process of developing the shipping logistics service supply chain, handling the shipping companies and ports, the relationship between shipping companies and third-party logistics becomes very important. Moreover, the core of the shipping logistics service supply chain is mainly reflected in how shipping companies use integrated

and coordinated thinking to deal with complex and ever-changing external situations, plan, coordinate, control and optimize the entire shipping system, and improve the shipping industry supply system. Quality and efficiency. (PH Tseng, 2015) The main goal is to provide products for upstream and downstream shippers, and they can be delivered to accurate locations in accurate time, according to accurate quantities, quality, and status, so that the total cost of consumption or consumption of the entire process is low. (Huang Youfang, 2016) The specific analysis will be listed later.

**Michael Porter five forces model**



**The bargaining power of the supplier:** After forming the shipping service supply chain, it will occupy a more favorable position in the supplier's relationship. The reasons are as follows: First, the demand will increase, and it will be more advantageous to negotiate with suppliers. Second, the demand will be more stable and ensure the long-term and stable supply of goods. Third, the development of the supply chain will ensure the interests of suppliers. At the same time, because of the special nature of the shipping industry, the long-

term contracts are generally signed, so the prices cannot be adjusted in time. Therefore, although the development of a shipping service supply chain can help gain a favorable position, this help is also limited.

**The bargaining power of the buyer:** After the improvement of the shipping service supply chain, it is certainly in the buyer's bargaining process to occupy a favorable position. Because after the formation of the supply chain, there are many beneficial effects on the buyer, the most direct is that the shipping company forming the supply chain can provide a more favorable price, because the supply chain can significantly reduce costs after the formation. In addition, it is more convenient for the buyer. It only needs to contact the shipping company to complete the point-to-point transportation. It is no longer the port-to-port transportation. After the supply chain is improved, there will be more capital, and thus there will be more weight when negotiating with the buyer. At the same time, it can also provide the buyer with a variety of services including customized services.

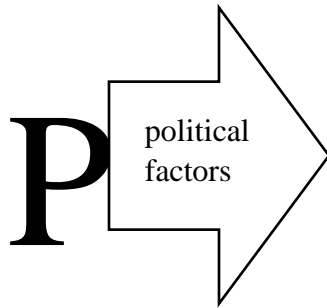
**Threat of new entrants:** After the supply chain is formed, the threat of potential entrants will be reduced. If other companies are involved in the supply chain, it will only become part of the supply chain. It will only make the supply chain more complete, provide more services, and reduce costs. If other companies cannot integrate into the supply chain, a single company will have difficulty competing with the entire supply chain.

**Substitutes:** Alternatives are less likely to emerge because supply chains are diverse, and even the same industry is unlikely to have the same supply chain. Even if the supply chain functions are similar, the services provided by it are not all the same. At the same time, this also requires shipping companies to consider special services and customized services when developing shipping service supply chains.

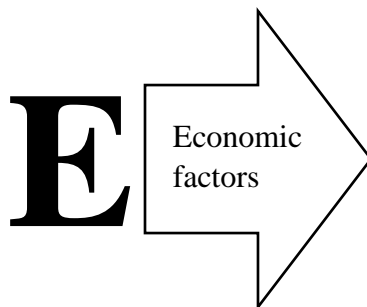
**Rivalry:** The competition among companies in the unified industry still exists, but there is no single competition when there is a single shipping company. The reasons are: 1. The supply chain and the supply chain cannot be exactly the same. In time, other shipping companies have also formed a supply chain. The services they provide cannot be identical. 2. Relative to wanted competition, after the supply chain is formed, competition will be relatively reduced. 3. The formation of supply chain not only includes the cooperation of

upstream and downstream companies, but also sometimes requires cooperation and cooperation among shipping companies, such as shipping alliances.

### PESTEL analysis



As far as China is concerned, there are still no specific policies on shipping service supply chains. In 2017, the Ministry of Commerce and the Ministry of Finance issued the “Notice on Launching the Supply Chain System Construction Work”. After the establishment of the supply chain system in 17 key cities in the country, the country’s third heavyweight policy on the development of the supply chain is also This means that China's supply chain is about to face major changes. Therefore, as far as China is concerned, the development of the shipping service supply chain is supported by national policies and has great support. From an international perspective, the development of the shipping supply chain in developed countries is relatively complete, and policy formulation is also more complete than in China. However, shipping supply chain is the trend of the times. Furthermore, the modern shipping service industry lags, including insurance, arbitration, and law.



In terms of economy, the shipping supply chain attracts capital investment. At the same time, after the shipping supply chain is improved, it can reduce costs and increase profits for shipping companies and other related companies and bring economic benefits to the entire industry. At the same time, there are also financial risks in the shipping supply chain. When developing the supply chain, special attention must be paid to financial risks.

# S

Social factors

The development of the shipping service supply chain is a development trend of the shipping industry and can help solve the problem of excess capacity. At the same time, after the supply chain is formed, it can promote upstream and downstream cooperation, promote the dissemination of information, and share resources. On the other hand, it also saves resources. At the same time, the development of the supply chain will also require talents in the supply chain, stimulating employment in this area. However, China has started late in the supply chain, and talent and technology need to be accelerated and improved.

# T

Technological factors

The future supply chain must be a smart supply chain with three capabilities: visual (eye), perceivable (brain), and adjustable (body). The Internet of Things, artificial intelligence, and blockchain are the three most important technologies for developing supply chains. The international community is vigorously developing these three major technologies. (Wanao,2018) However, the supply chain department only needs technical support, but also needs theoretical and practical support. Although the direction of developing the supply chain has been found, it still requires a lot of resources to improve the supply chain.

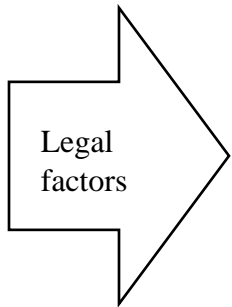
# E

Environmental factors

There are fewer supply chain and environmental factors. However, the establishment of supply chain is for the effective use of resources, which can reduce the waste of resources and benefit the environment. At the same time, resource sharing and resource recovery all reduce emissions and help protect the environment.



# L



There are no laws and regulations that are specific to the supply chain. In 2017, the Ministry of Commerce and the Ministry of Finance issued the “Notice on Launching the Supply Chain System Construction Work”. It reflects from the side that China needs to strengthen the legislation in the supply chain and improve the legal construction in this area.

Through PESTEL analysis, it can be concluded that the development of shipping service supply chain still has more favorable factors. Although some technical problems will be encountered during the development process, the supply chain will continue to be driven by other factors.

### SWOT analysis

Strengths	Weaknesses
<p>It can fundamentally ease the problem of excessive shipping capacity in the shipping market;</p> <p>Can significantly reduce costs;</p> <p>Form a shipping alliance, resource sharing;</p> <p>Change the management mode of shipping companies and promote shipping upgrades;</p> <p>Can provide more personalized services, increase customer loyalty and create competitive advantages;</p> <p>In line with national policies, subject to policy tilt;</p>	<p>There is no clear goal. What kind of supply chain is the best supply chain?</p> <p>There are many difficulties that need to be overcome in the development process;</p> <p>The theoretical system is incomplete;</p> <p>Excess capacity is a long-standing problem. It takes a while to develop the supply chain.</p> <p>The distribution of interests between different companies needs negotiation;</p> <p>Supply chain financial risk;</p>
Opportunities	Threats

<p>This is a sustainable development strategy;</p> <p>Can attract capital injections;</p> <p>Attract more customers</p> <p>Improve the stability of cooperation between upstream and downstream companies;</p> <p>The development prospects are bright;</p> <p>Can help shipping companies survive the current market downturn;</p> <p>Can form a shipping alliance;</p> <p>Can develop its own characteristic services;</p>	<p>The entire shipping industry is developing its supply chain, and competition in the shipping supply chain will intensify.</p> <p>In the formation process, the collision between different industries will intensify;</p> <p>Insufficient protection and risk assessment of the supply chain;</p> <p>Insufficient knowledge and skills;</p>
--	--

From the SWOT analysis, we can see that the development of the shipping supply chain has more advantages and can effectively compensate for the deficiencies in the first method. In addition, the development of the supply chain can solve the problem of reducing costs and increasing efficiency of shipping companies from a long-term perspective. Of course, there are some technical problems in developing a shipping service supply chain. Therefore, some shipping companies have adopted methods to achieve cost reduction and efficiency increase through technological innovation.

### **3.3 The way to reduce cost through technological innovation**

Whether it is the strategy of a large ship or the development of a shipping service supply chain, it is inseparable from the technical support. At the same time, technology needs to be expressed through services. Nowadays, there are four major technological developments in the shipping industry, namely blockchain technology, unmanned ship technology, cloud technology, and virtual reality technology. The development of technology will inevitably bring new opportunities to the shipping industry, which will bring new opportunities for shipping companies to reduce costs and increase efficiency.

The so-called blockchain technology, also known as distributed ledger technology, is an Internet database technology that is characterized by decentralized, open and transparent, so that everyone can participate in the decentralization of database blockchain technology. The characteristics of the transformation will bring about tremendous changes to the shipping industry. For example, it will not only eliminate middlemen, but it will also save a great deal of time and money while improving operational efficiency. Currently, Maersk and IBM have taken the lead in opening the blockchain trading platform. Other shipping companies are also closely following this.

Unmanned ship technology and automation are inextricably linked. Automation technology has great potential and is a comprehensive technology. Unmanned ship technology, everyone is most concerned about this point is that this technology can effectively reduce the risk of human error on board, after all, human error has always been the main cause of marine accidents. In the future, in the era of unmanned ships, the masters of the shipping industry will likely be transformed from shipowners to technology companies.

Cloud technology refers to a hosting technology that integrates hardware, software, and network resources in a wide area network or local area network to implement data calculation, storage, processing, and sharing. Many devices nowadays can develop more application services through cloud computing technology. In the shipping industry, cloud technology can not only easily access databases without being constrained by time and place, but it can also eliminate data silos. In addition, the introduction of cloud technology will also bring the following advantages to the shipping industry. First, it can provide land and sea employees. The better the quality of communication, followed by cost savings. The third point is to use this technology to remotely access corporate data. Finally, cloud technology can also prevent data loss.

Virtual reality technology is a computer simulation system that can create and experience a virtual world. It uses a computer to generate a simulation environment. It is a multi-source information fusion, interactive three-dimensional dynamic visual scene and physical behavior system simulation. Immerse yourself in this environment. As early as the beginning of 2017, Japanese and Korean shipping companies have already widely applied

VR technology. In May 2017, Winterthur Engine Co., Ltd. (WinGD) installed the W-Xpert full-featured simulator for crew training. (Sohu, 2018)

All four technologies are helpful to reducing costs and increasing efficiency. In addition, technical upgrades in shipbuilding and other infrastructure are also necessary. When any of the above four technologies reaches a certain level, it will have a profound impact on shipping companies.

### **Michael Porter five forces model**

The bargaining power of the supplier	After technological innovation, it will not be able to directly influence the bargaining power of suppliers. Technology can only affect the product first, and the product then affects the bargaining power of the supplier. Of course, the emergence of new technologies may require cooperation with new suppliers. In addition, upgrading of technology will eliminate some old equipment and introduce new equipment. Overall, it will make shipping companies have an advantageous position in bargaining. In addition, because technology upgrades often require new equipment, they are not limited by long-term contracts.
The bargaining power of the buyer	In shipping companies, the upgrading of technology is mainly to reduce costs and enhance their bargaining power with buyers. Therefore, a good technology upgrade can greatly improve the bargaining position of shipping companies and buyers. If the technology reaches a certain height, and the services provided by the shipping companies are of higher quality in the same industry, they can take the initiative, even if the shipping market is not booming.
Threat of new entrants	On the technical side, the potential entrants have less threat. Threats are mainly theft of technology, or plagiarism, or some new technologies are being imitated.
Substitutes	The alternative threat of technology is still very strong, especially in the era of information technology, the replacement of technology is fast. The emergence of new technologies will bring profits for a

	<p>period of time, but will soon be replaced by other, more advanced technologies. Therefore, this requires shipping companies to pay attention to protecting their own unique technologies and sophisticated technologies.</p>
Rivalry	<p>The competition between the industry is relatively intense. And, this competition is mainly concentrated in the technology research and development stage. The research direction of the same industry is basically the same. Whose technology matures before it is first introduced to the market will occupy a great advantage in the market. When similar technologies emerge in time, it will be difficult to compete. At the same time, competition among industries also appears in sophisticated technologies, or feature technologies.</p>

Through the development of science and technology can also significantly reduce costs, in a short period of time, there will be no risk of invaders, but the rapid update of science and technology, it is necessary to continue to increase investment in science and technology, so that the company has been in a favorable position.

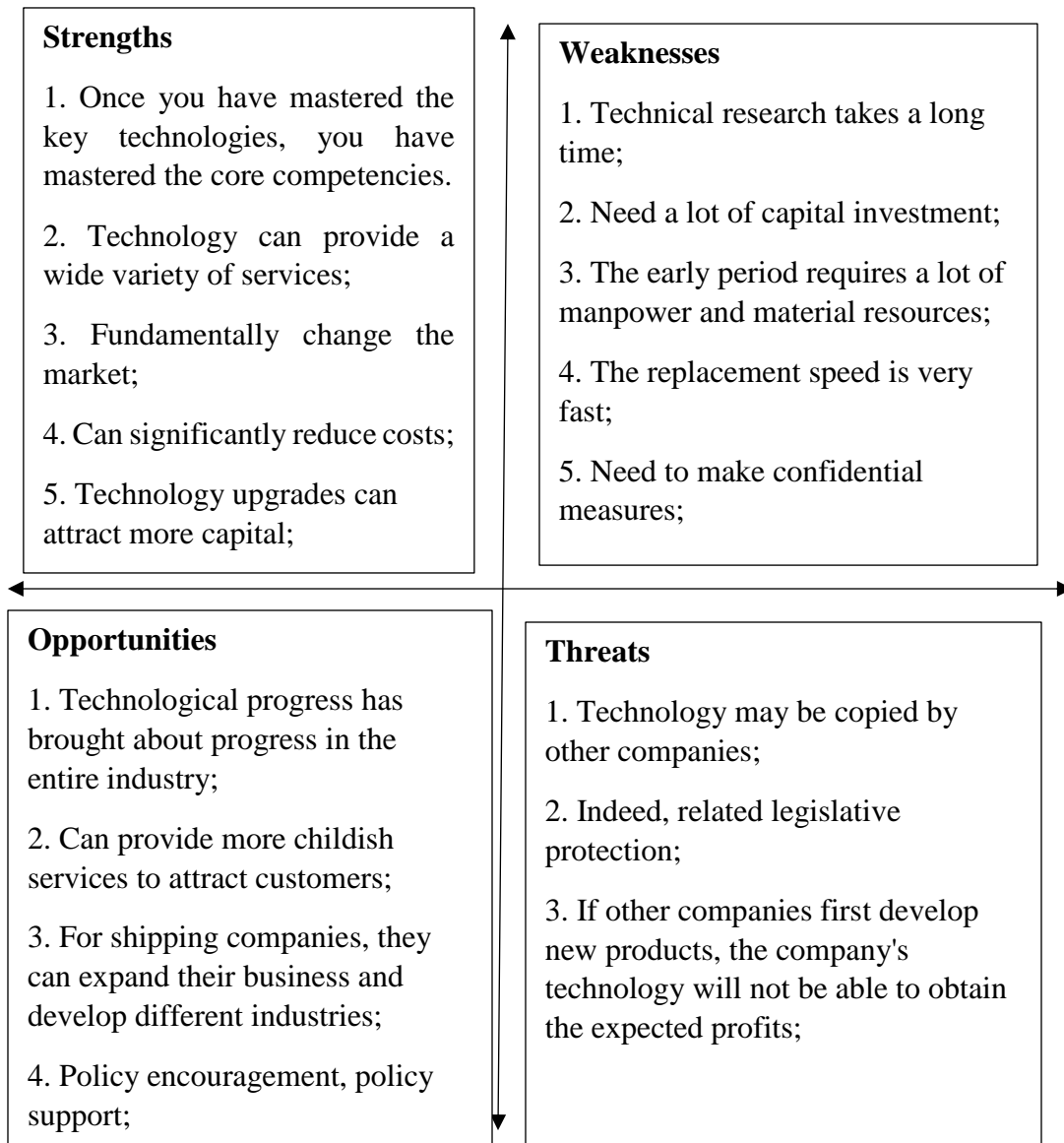
**PESTEL analysis**

Political	<p>From the international perspective, innovation and technology are always driven by the times. Technological innovation has always been a very important position, and the emergence of new technologies will even subvert the entire industry. As far as China is concerned, the Chinese government is now vigorously encouraging innovation and technological upgrading and insisting that science and technology are primary productivity.</p>
Economic	<p>As far as shipping companies are concerned, the upgrading of technology is mainly to provide customers with better services, but technology cannot directly bring economic benefits. However, technological upgrading requires the injection of large amounts of</p>

	capital, which means that a large amount of capital needs to be injected in the early stage, and technological R&D may not be successful, that is, investment may not necessarily be rewarded.
Social	After China's reform and opening, the country with a strong science and technology is the unchanging theme, supported by the background of the times. In addition, the technology still needs to have innovative spirits and master certain technical talents. It is not difficult to train technical personnel, but it is not easy to cultivate top-notch talents.
Technological	Technology needs to improve step by step.
Environmental	The shipping companies must respond to the overcapacity without the upgrading of technology, whether it is a large ship strategy or the development of a shipping service supply chain. Therefore, technology upgrades are necessary and are in line with the industry's prospects.
Legal	Technology upgrades need to comply with international law and local laws in different countries. Of course, after the emergence of new technologies, new problems will arise, and some problems may require legislation. In addition to the new technology, the demon is required to apply for patents to protect the company's intellectual property rights.

The 21st century is a society with rapid technological development. Therefore, the social environment is conducive to the development of science and technology.

## SWOT analysis



It is also an effective way to realize cost reduction and efficiency increase through technological innovation. In addition, technical support is required in the implementation of the two previous methods. However, technological innovations also have the disadvantage that they need to be represented by the first two methods. Therefore, the best position for technological innovation is to support the realization of the first two methods. In order to better analyze how shipping company, use these three methods to achieve cost reduction and efficiency gains, Maersk is used as a case in this article to look at the advantages of developing shipping service supply chains.

## **4. How Maersk Line company develop service supply chain**

### **4.1 Introduction of Maersk Line company**

Maersk Line, known as "the world's largest shipping company", is AP Muller - one of the largest subsidiaries of the Maersk Group, and the world's largest container shipping company, merged with Maersk Sealand UK P & O Nedlloyd was reorganized and now accounts for 17% of the world container shipping market. Maersk Line's fleet consists of more than 470 container ships and 3.1 million containers, with a total capacity of more than 1800000 TEU, which ensures reliable and comprehensive global coverage. (Jctrans, 2018) The Maersk Group has more than 150 ships and 7 million dwt of various types of vessels such as container ships, cruise ships, bulk carriers, supply vessels, and drilling vessels in shipping.

Maersk has five major businesses in containers. Maersk Line has already been introduced above. Maersk Logistics, a world-class logistics company, can provide customers with an efficient supply chain. Maersk Container Industry, produces refrigerated containers and various other containers. Safmaine mainly operates North-South and African routes. Maersk also has other businesses, the larger ones are Maersk Oiland Gas, oil extraction in the North Sea, Qatar, Algeria and Kazakhstan; Maersk Tankers, transport of crude oil, various refined oil and natural gas; Maersk Contractors, the largest in the world A technologically advanced self-service platform for oil exploration around the world; Maersk Supply Service can provide ocean-going services such as drilling and offshore cable laying. (Maersk Line, 2018).

Maersk Shipping organization structure is divided into three levels, internship and two-level management. The upper level is the headquarters of Copenhagen; in the middle are three divisions, namely, the European branch of Copenhagen, the Asian branch of Singapore and the Americas branch of New Jersey; each branch has several regional offices. Maersk Line's central Copenhagen is responsible for formulating major decisions concerning cooperation, finance, shipping and container construction; the three divisions are responsible for marketing, ship scheduling, equipment management and budgeting within the framework of the headquarters' decision; regional offices are Divisional regulations.



Maersk's organizational structure has the following characteristics: 1) Market-oriented, continuous improvement of the organizational structure of Maersk Line, decentralized management functions, strengthening of regional office responsibilities and marketing functions, but also increase their decision-making power. 2) Maersk Line regards regional divisions as the focus of marketing. 3) Give full play to the marketing role of the office. Maersk Line's policy is to strive to establish its own office whenever possible. 4) Strengthen the management of water transportation among various branches and offices and coordinate the three levels of Maerskian shipping organization and the forms of two-level management are the features of its internal management. (Z Yang, D Chen, 2017).

After the outbreak of the financial crisis, global trade fell by 12% because of its impact. The global volume of container shipments plummeted, freight rates plummeted, and oil prices fluctuate dramatically. Maersk's shipping business suffered losses in succession. In 2009, Maersk suffered its first annual loss in history. In order to break the current situation of loss, Maersk increased its investment in cruise ships, oil industry and container handling terminals other than core shipping business, to ease the passive situation caused by shipping industry fluctuations, and also made major adjustments on routes and sealed up. The capacity of large container ships will be slowed down to reduce fuel consumption. At the same time, the company also changed in four directions, so that the company has a clear profitability.

1. Diversification of business. In 2009, Maersk acquired the United States Devon Energy Corp. In early 2010, Maersk Container Terminals set up its Asia Pacific headquarters in Shanghai, playing its own advantages, working closely with China, and actively investing in the development of a container port of a parent port with a manufacturing base. In October 2011, Maersk sold its LNG transportation business for US\$1.4 billion, and increased its investment in the construction of oil tankers, the oil industry, drilling and container terminals. (Zhendong&Huyuan, 2013) These initiatives have achieved significant results and have made the company successful in turning losses into profits.
2. After the outbreak of the financial crisis, to reduce fuel costs, Maersk Line implemented a strategy to reduce the speed of shipping. To compensate for the

- slowdown in sailing speed, one or two extra Clippers were added to each route to satisfy some customers. Special needs. In 2011, Maersk Line launched the “Daily Maersk” service project on the Asia-Europe route and ensured that customers receive goods on time every day and deliver it to customers for compensation on a delayed basis. These services have received better feedback.
3. In 1984, Maersk Group established its first office in China in Guangzhou. In these years of China, Maersk has witnessed the rapid development of China's shipping industry. Maersk is one of the first shipping companies to enter China. This has a decisive influence on Maersk’s current industrial scale and industry status.
  4. Extend the industrial chain Develop integrated logistics and develop the shipping supply chain. It will be described in detail later.

## **4.2 Analysis of Maersk Line company’s service supply chain**

Maersk actively formed shipping alliances with other shipping giants to increase the overall utilization of resources. Its 2M alliance with MSC (Mediterranean Shipping) has continuously optimized and upgraded its resource allocation, ship equipment customization, joint use of hardware and software, joint operation management, multimodal transport, and integrated logistics services, and diversified operations. Improve service quality, reduce operating costs and increase overall competitiveness.

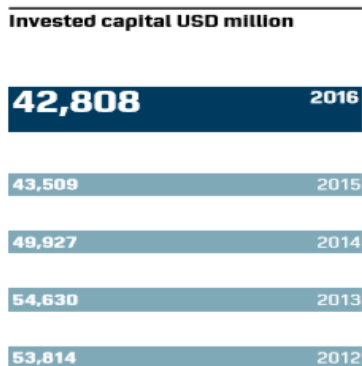
In addition to shipping alliances, Maersk is also actively developing shipping service supply chains. One of the more obvious features is the development of the terminal business and the transformation to public terminal service providers. Maersk Container Terminals, APMT for short, operates more than 50 terminals in 32 countries on 5 continents. In addition, after APMT's investment direction shifted from North America and Europe to the Far East, it gradually shifted to the relatively backward areas in South Asia, Africa and other ports.

Moreover, IBM and Danish transport and logistics company Maersk announced on January 16 that they are forming an unnamed blockchain-based shipping and supply chain company. The goal of this cooperation is to enable the blockchain to be fully commercialized in all

aspects of the global supply chain system, from shipping to ports, from banks to customs. (BTC, 2018) The blockchain solution was built by IBM and Maersk, a global leader in the transportation logistics industry, based on Hyperledger Fabric for use by the maritime and logistics industries. The solution digitizes end-to-end supply chain processes, helps companies manage and track written records of tens of millions of shipping containers around the world, improves information transparency among trading partners and enables highly secure information sharing, after large-scale application It is expected to save the industry billions of dollars.

The solution uses blockchain technology to achieve transparency of information among parties, which can greatly reduce the cost and complexity of trade. It aims to help companies reduce fraud and errors, shorten the time spent in the process of transportation and shipping, and improve Inventory management ultimately reduces waste and reduces costs.

**A.P. Moller - Maersk** employs around 88,000 employees across 130 countries.



From the table, Maersk's invested capital has decreased year by year. In 2016, the total investment volume hit a new low.

Invested capital	APM Terminals		Damco		Maersk Supply Service	
	USD million	ratio	USD million	ratio	USD million	ratio
2012	5495	10.7%	512	1.0%	2206	4.2%
2013	6177	12.2%	412	0.8%	1699	3.4%
2014	5933	11.9%	321	0.6%	1704	3.4%
2015	6177	14.3%	203	0.5%	1769	4.1%
2016	7967	18.6%	232	0.5%	582	1.4%

(Maersk. A/S, 2017)

APM Terminals provides port and inland infrastructure to drive global commerce. And as the table shows, the ratio increased very fast, especially in 2016. So, Maersk will pay more attention on the terminals, to build better infrastructure which can help to develop service supply chain. Damco is a world-leading provider of freight forwarding and supply chain management service. Maersk supply service is a leading provider of global offshore marine service. Both are attracted less capital in 2016. In addition, Maersk loss a lot money in 2016. And in 2017, Maersk has increased its supply chain construction, at the same time, has cooperated with a number of companies to actively develop its supply chain and turn the company into a profitable one.

In mid-2017, Maersk Group announced the provision of a new Maersk Trade Finance Maersk Trade Finance trade financing service and may consider applying for a bank license in India. "Maersk Trade Finance" is a short-term financing or credit facilitation electronic platform for shippers, enabling Maersk customers not only to enjoy online shipping services, but also to apply for capital loans based on Maersk Line orders (including before/after loading) and can be used to pay A shipping or other use.

Unlike banks providing trade finance, they generally look at the balance sheet and consider it again. The only point that Maersk grants loans is that the goods they carry are used as collateral and no other collateral or guarantees are needed to help SMEs avoid the pitfalls of mortgages. Such as Maersk has more than 100 years of history, more than 130 branches worldwide, has a natural advantage in doing supply chain finance, has its own big data can analyze customer history and possible risks. 100 years of big data are comparable to banks without any financial institutions. Digitized big data is the most profitable and most sexy part of future logistics, including shipping. The future business competition is actually data competition. (Sohu, 2017)

Through Maersk's financial comparison between 2017 and 2016, it can help better illustrate the advantages of developing the service supply chain. The following chart shows Maersk's financial situation for two years:

USD million	2017	2016	Change
Revenue	30,945	27,266	13%
Profit before depreciation and impairment losses, etc. (EBITDA)	3,532	2,475	43%
Depreciation, amortization and impairment losses	3,015	2,495	21%
Gain on sale of non-current assets, etc. net	154	190	-19%
Profit/loss before financial items(EBIT)	641	245	162%
Profit/loss before tax	25	-298	-108%
Profit/loss for year- continuing operations	-194	-469	-59%
Profit/loss for year- discontinued operations	970	1,428	32%
Profit/loss for period	-1,164	-1,897	39%
Underlying profit/loss	356	-496	-172%
Cash flow from operating activities	2,596	1,264	105%
Cash flow used for capital expenditure	-6,187	-2,073	198%
Return on invested capital after tax. – continuing operations	1.6%	0.5%	

(Maersk, 2018)

It can be concluded from the table that in 2017 Maersk's profit increased more than 2016. From an objective point of view, the main reasons are changes in container freight rates, changes in container volumes, and changes in fuel prices. From a subjective point of view, it is also a strategic change in the company. In 2017, Maersk's important strategy was to increase the development of the shipping service supply chain and make substantial progress.

Whether it is the development of blockchain or the development of supply chain finance, Maersk is developing the shipping logistics service supply chain. It is also a new outlet that Maersk continues to explore after losses in 2009. At the same time, Maersk will also have other strategic initiatives to better develop the logistics service supply chain.

### **4.3 Maersk Line's enlightenment to us**

Relying solely on container shipping technology, it has been difficult to achieve growth in the profits of shipping companies. Maersk has mastered worldwide transportation networks and agencies and has used the convenience of multimodal transport and advanced information technology. All these have laid a solid foundation for the development of integrated logistics. The competition in the container market extends from the coast to the inland, and the importance of inland and coastal freight passages is becoming increasingly prominent. The development of the shipping supply chain, especially the sea-railway

transport link, has become a key link. Shipping companies must constantly optimize the fleet structure, adjust the transport organization, develop a shipping supply chain centered on multimodal transport, extend the value-added logistics services, and extend the service from “port to port” to the complete “door to door” service.

Maersk can be said to be the initiator and victim of price warfare. From the starters to the victims to the advocates of a healthy and orderly market with stable prices and win-win cooperation, Maersk’s subjective change shows that the “price war” is absolutely not desirable. It is the best way out for Baotou to keep warm. When standing on the perspective of the shipping industry, all liner companies are looking for a good strategy to promote the sustainable development of the industry and a high degree of flexibility in adjusting the business strategy at any time according to market changes.

Playing a price war will only result in two loses. From the point of view of Maersk’s development, after the scale reaches a certain level, it can no longer expand its own scale, and it cannot use the scale effect to play a price war. Good competition is high quality competition. In addition, the cooperation alliance has become the main trend of the shipping industry. This cooperation is not only vertical cooperation, that is, cooperation between upstream and downstream enterprises, but also horizontal cooperation, that is, cooperation between competitors. The development of the shipping service supply chain has become Maersk’s goal, and has achieved certain results. At the same time, other shipping companies such as COSCO Group are also striving to develop the aviation service supply chain.

## **5. Summary and conclusion**

### **5.1 Author's recommendation**

The shipping supply chain is a network chain structure formed by a series of upstream and downstream enterprises or departments involved in providing shipping services to end users. It is a shipping supplier (including shipyards, spare parts suppliers, fuel suppliers, and crew supply companies. Etc.) → shipping supply (shipping company or its agent) → shipping demand (shipper or its agent) → international trade demand → economic development demand and port companies and related administrative departments together constitute a supply and demand chain structure. The shipping supply chain is divided into two segments: the core enterprise and the upstream and downstream supply chains. The two types are different: the downstream supply chain. In a nutshell, the shipping supply chain is a shipping company with a shipping company as its core enterprise, an upstream supply chain consisting of steel products, smelters, shipyards, spare parts supply, fuel supplies, etc., as well as ships, freight forwarders, and shippers. The downstream supply chain of intangible products (shipping services) is the main component, aiming at customer satisfaction and jointly fulfilling the supply chain of the transport function of the goods from the place of departure to the destination.

Today's shipping supply chain is not perfect. From the perspective of future development, on the one hand, shipping companies do not realize the importance of forming a shipping supply chain, stick to their existing businesses, and do not carry out business expansion and resource integration; On the other hand, large shippers, who are holding their sources of supply, are not satisfied with merely having the right to charter but want to expand their voice in the shipping market, earn more profits, and actively enter the market while the current ship market is sluggish. , build its own fleet.

For shipping companies, it is also not possible to blindly develop the shipping service supply chain. It is necessary to develop strategies step by step, develop some of these key technologies first, and then develop others. At the same time, in the process of developing the supply chain, we must also develop hardware. Only hardware support can better develop the supply chain. In the above article, the method of direct cost reduction and

efficiency enhancement, such as the ship strategy, can provide time for the development of the supply chain and reduce losses to a certain extent. Therefore, the shipping company's main raft is still the development of the shipping service supply chain. At the same time, it must also strive to directly reduce costs, that is, hardware upgrades.

## **5.2 Conclusion**

As one of the most important management ideas and methods for enhancing the competitiveness of enterprises in the 21st century, supply chain management has now received widespread attention from both domestic and foreign academics and the business community. Today, as the degree of global economic integration becomes higher and higher, shipping, as the leading carrier of international logistics, is not only an important part of the supply chain, but it is also a segment supply chain composed of multiple related companies or departments.

As an exploration transition period, the status of the shipping supply chain is not optimistic. First of all, shipping service is a demand derived from international trade. The world economy is also the forerunner of international trade. Therefore, the shipping supply chain is subject to the international economic environment. The rise and fall of the world economy reflects that there is a certain incubation period in international trade. And most of the international trade is future trade, and its demand for shipping is lagging behind. Generally, the recovery of the world economy has caused the development of international trade and will cause repercussions in the shipping market after 0.5 to 1 year. Secondly, there are parallel and mutual economic activities between companies in the shipping supply chain in the vertical and horizontal directions, as well as interactions and constraints. Suppliers with poor supply quality and capabilities will have an impact on suppliers with good performance. Third, the “bullwhip effect” that magnifies and amplifies the demand in the upstream of the supply chain is also prevalent in the shipping supply chain. The specific manifestation is that the fluctuation of shipping supply (the fluctuation of shipping capacity and freight rate) is greater than the fluctuation of shipping demand (the fluctuation of trade volume).



The development of shipping service supply chain is an effective way to reduce costs and increase efficiency in the context of excess capacity, and most shipping companies are working hard in this direction. Some companies have achieved certain results and eased the pressure brought by the market. This proves that shipping companies are right in developing the shipping supply chain. This article first introduces what is the shipping service supply chain, and enumerates three methods again, comparing them with Porter's five forces analysis model, PESTEL analysis and SWOT analysis, highlighting the advantages of the shipping service supply chain. Then, through analysis of Maersk's initiatives in the development of the supply chain, we draw conclusions based on actual conditions.

### **5.3 Outlook**

After the above analysis and comparison, it has concluded that shipping companies should lower their costs. However, this article still has some deficiencies. For example, this article does not delve into the structure of the supply chain and how shipping companies should develop shipping service supply chains. In addition, the analysis process is a qualitative analysis method used, and it does quantitative analysis, that is, data support. Of course, the main reason is that the development of the shipping service supply chain by shipping companies is still in its infancy and there is not enough data available for analysis. Therefore, based on these deficiencies, in the future research process, it should mainly explore how to develop the shipping service supply chain and how to overcome the problems encountered in the development process.

## References

Amber.M, (2015), 7 Characteristics of A Best in Class Supply Chain, <http://cerasis.com/2015/07/30/best-in-class-supply-chain/>

Baijiahao, (2017). Develop smart supply chain, reduce costs and increase efficiency for enterprises! How much power does logistics contribute? Four Seasons Finance <http://baijiahao.baidu.com/s?id=1561373339643098&wfr=spider&for=pc>, in Chinese

Baike, (2018). PESTEL analysis model, <https://baike.baidu.com/item/PESTELanalysismodel/5913650?fr=aladdin>

Baike, (2018). SWOT analysis, <https://baike.baidu.com/item/SWOTanalysis/150223?fromtitle=swot%E5%88%86%E6%9E%90&fromid=120052&fr=aladdin>

BTC, (2018). IBM and Maersk start building blockchain-based supply chain companies, <http://www.8btc.com/ibm-maersk-blockchain-supply-chain>

China Ports, 2014, Analysis of the Development Status of China Shipping Enterprises, <http://www.port.org.cn/info/201404/173847.htm>

DR Quintana, (2016) Shipping logistics concept icons set, human hand smart phone illustration, repository.ucatolica.edu.co

Huang Ruishuo, (2017). Talking about the Application of Internet of Things in Shipping, Logistics and Ports, Knowledge economy[J]

Huang Ruishuo, (2017). Research on the Cooperation and Optimization Strategy of Shipping Logistics Service Supply Chain, Times Finance[J]

Huang Youfang, (2016). Talking about the Supply-side Reform of Shipping Industry from the Supply Chain, International Shipping Network, [http://www.eworldship.com/html/2016/person\\_character\\_1207/122676.html](http://www.eworldship.com/html/2016/person_character_1207/122676.html)

Jctrans, (2018). Maersk Group's 2017 annual financial report, <http://info.jctrans.com/newspd/cgs/20182122384617.shtml>

Liewei, (2016). Upgrade and expand shipping companies to reduce costs and increase efficiency, China Shipping News[J]

Lu Zhang, (2017). Research on the Improvement of Supply Chain Management Under Drop-shipping Model, ResearchGate

MBAlib, (2018). Porter Five Force Analysis Model, <http://wiki.mbalib.com/zh-tw/PorterFiveForceAnalysisModel>

Maersk Line, (2018). Why Maersk Line? <https://www.maerskline.com/about/why-maersk-line>

Maersk A/S, A.P.Moller, 2017, Annul report 2016, pp11-12

PH Tseng, CH Liao, Supply chain integration, information technology, market orientation and firm performance in container shipping firms, "International Journal of Logistics Management", 2015, 26 (1) :82-106

Rongyan Zhu, (2014). Research on the Basic Problems of Coordination of Shipping Logistics Service Supply Chain, Modern Logistics[J]

Sohu, (2017). Maersk and IBM Introduce First Cross-Border Supply Chain Solution Based on Blockchain, [http://www.sohu.com/a/129968505\\_430753](http://www.sohu.com/a/129968505_430753)

Sohu, (2018). In the future, this "four major new technologies" will surely subvert the development of the shipping industry! [http://www.sohu.com/a/232615399\\_100152951](http://www.sohu.com/a/232615399_100152951)

T Poulsen, (2015). Changing strategies in global wind energy shipping, logistics, and supply chain management, ResearchGate

Wanao, (2018). Supply Chain Outlook: Three Technologies Reshape Future Supply Chain [http://www.sohu.com/a/217029000\\_100051236](http://www.sohu.com/a/217029000_100051236)

World Shipping Council, (2018), Cargo and the Supply Chain, <http://www.worldshipping.org/industry-issues/security/cargo-and-the-supply-chain>

Yan Yang, (2009). Status Analysis and Optimization Strategy of Shipping Enterprise Supply Chain, China Water Transport[J]

Yanqiu.Lu, (2015). Chain Service - Value Chain Embeddedness in Shipping Supply Chain, Shipping Management[J]

Zhendong&Huyuan, (2013). Maersk Line Case Study, Container Transport and Multimodal Course Design Report

Z Yang, D Chen, (2017). Industrial Transfer Trend and Shipping Logistics Development Strategy Along Maritime Silk Road, Navigation of China