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The construction and development of Shanghai International Shipping Center

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The construction and development of Shanghai International Shipping Center

By

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China

A research paper submitted to the World Maritime University in partial Fulfillment of the requirements for the award of the degree of

MASTER OF SCIENCE

In

INTERNATIONAL TRANSPORT AND LOGISTICS

DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

(Signature):_____

(Date):_____

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ABASTRACT

Title of Dissertation: **The construction and development of Shanghai International Shipping Center**

Degree: **Master of Science in International Transport and Logistics**

Abstract: After ten years' construction, many functions of international shipping center have become true in shanghai, including improvement of port environment, gathering of shipping produce factors, regulation in shipping market and the birth of distributing center of shipping information and R&D center of shipping policies. As the efficient running of Yang Shan port's first-stage and putting into production of second-stage, the construction of Shanghai international shipping center has got partial achievement and came to a new development stage. Meanwhile, the government raises a point of building Dalian as important international shipping center in northeast-Asia and building Tianjin as international shipping center. So the environment of Shanghai international center's construction has changed greatly. Therefore, the content and detailed aim of the next stage of Shanghai international shipping center's construction should be deeply studied.

This thesis is written based on the background above. This thesis summarized the basic theories and phylogeny of international shipping center firstly and proposed

the development directions of international shipping market and shipping center in the new international circumstances. Based on the formation-process of international shipping center, this thesis focused on the influencing factors of international shipping center, and constructed an entire evaluation indicators system of international shipping center. This system synthetically analyzed the international shipping center both from basic and soft environment constructions. It also can be used as the evaluation evidence of the Shanghai international shipping center's position in the world.

In addition, in order to further clear about the building-stage of Shanghai international shipping center, and point out the building direction of next step, this thesis classified the shipping centers with the method of principal component analysis and clustering analysis. It came to the conclusion that Shanghai, Singapore, Hong Kong, Busan and Kaohsiung are at the same level. It illustrated that the basic environmental construction of Shanghai international shipping center has immediately effected and met basic requirements. The next step should focus on the soft environment. Finally, this paper has mentioned the our government target and the financial crisis brought the problems.

At last, this thesis gave some suggestions about how to face the financial crisis and how to enhance the soft environment of Shanghai international shipping center.

Keywords: Shanghai international shipping center, evaluation indicators system, principal component analysis, cluster analysis.

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List of abbreviation

R & D	Research and development
UNCTAD	The United Nations Conference on Trade and Developmen
PCA	Principal component analysis
CA	Cluster analysis
SPSS	Statistical Product and Service Solutions
TEU	Twenty foot equivalent unit
EDI	Electronic Data Interchange
BDI	Baltic Exchange Dry Index

Chapter 1 INTRODUCTION

1.1 Background of selected topic

Early in 1996, Lipeng, the Prime Minister of China in that time, announced to the world that Shanghai would be the international shipping center in behavior of council. To reach the aim, many experts have studied the project macroscopically and microscopically, to offer theoretical support and suggestion from both one aspect to all aspects. As we all know, International shipping center is the great support to international financial center. Shanghai wants to grow up and become international financial center city, participate in international division and competition. So Shanghai must energetically develop international shipping industry and build the network of traffic and transportation, so that build it into international shipping center as soon as possible. After ten years' construction, many functions of international shipping center have become true in shanghai, including improvement of port environment, gathering of shipping produce factors, regulation in shipping market, development of shipping service industry, the birth of distribution center of

shipping information , R&D center of shipping policies, government service for shipping enterpise . As the efficient running of Yang Shan port's first-stage and putting into production of second-stage, the construction of Shanghai international shipping center has got partial achievement and came to a new development stage.

Meanwhile, the government raises a point of building Dalian as important international shipping center in northeast-Asia and building Tianjin into international shipping center. So the environment of Shanghai international center's construction has changed greatly. Therefore, the content and detailed aim of the next stage of Shanghai international shipping center's construction should be deeply studied.

However, the situation of international economy is very changeable. The rapid spread of international financial crisis and slowdown in world economic development has greatly influenced Shanghai economy. In 2008, GDP growth in Shanghai is 9.7% which is the first time less than 10% since 1992. Facing economic crisis, how does Shanghai international shipping center deal with such tough situation and how to find opportunity in this crisis. It is very worth to discuss such a series of problem. This thesis is written based on the background above.

1.2 Literature review

1.2.1 Recent research on development of international shipping center

With the smooth transition of Hong Kong international shipping center to China and construction of Shanghai International Shipping Center, the attention to the development of an international shipping center is increasingly paid by all sectors of our society. In recent years, the scientists home and abroad have done quite a lot of

research on international shipping center which can be divided into two levels generally.

(1) Forming condition of international shipping center

The essays mainly focus on the forming condition of shipping center's construction which involved port construction, collection and separation system, financial support, policy and legislation etc. This kind of essay is very macroscopic and regular. Foreign Scholar, K. Dabrowsl point out that, in a capitalist market mechanism, continuously improving the openness of shipping market will influence Shipping center. Sun guangxi is typical of all the domestic author who thinks that international shipping center must be a port city which should have the mature international shipping market, strong hinterland economy, good logistic support, first-class port facilities and conditions, deep-water channel that can call large vessel, complete collection and separation system, perfect service and management system, active-support policies and good legal environment. The article *Construction Project Investment and Financing Policy Research of Shanghai International Shipping Center* written by professor Shao ruiqin argued that the development of investment and financing policy is a good way to ensure the construction of Shanghai international shipping center and it is also great adjustment mechanism to mobilize the enthusiasm in all the department. Hanqian in her article *Shanghai International Shipping Center Construction and financial services* point out that financial service should develop means of shipping finance, encourage innovative financing method, standardize and develop the marine insurance market.

(2) Specific study of international shipping center home and abroad

These articles also mainly aim at practical study to international shipping center which including the operation of international shipping center, focusing specific port

development pattern and strategies etc. Such kinds of studies are very specific and practical. Baird A.J.Rejionder study port pattern and established the lifecycle mold of main container port based on Europe port. Scholar Jame.Wang points out that the development of the Hong Kong container port in a regional context is examined in the light of Hayuth's five-stage load-center model. The port-hinterland relationship between Hong Kong and China is unique as the hub and its hinterland belonged to two economies at different development levels and of different institutional settings. The development gap in containerization resulted in the inter-port competition stage being missed when Hong Kong became a load center. The Chinese scholar HuXin is very representative in operation of international shipping center. In her view point, the operation of international shipping center can generally divided into three types: the first is to provide cargo distribution services for hinterland, the second type is based on the hub port to transit goods to all over the world, the third type is to provide market transactions and shipping service. Yang Jianyong think that based on economic function, international shipping center can be divided into: Shipping in the transition mode, value-added processing mode and resource allocation mode.

1.2.2 Existing problem

Though there are a lot of researches on international shipping center, problem and weakness still existing.

(1) Theoretical research about our country’s shipping center is insufficient

At present, the researches about our country’s shipping center are based on Chinese government planning and development strategies. Therefore, such kinds of studies are very specific and practical and theoretical researches about our country’s shipping center are insufficient.

(2) Research can not effectively combine with relevant disciplines

Building Shanghai International Shipping Center is a very complex project which involves economics, management, marketing, systems science, industrial economics and many other disciplines. However, the study of shanghai international shipping center has not formed a complete system only with some subjects. Therefore, the study is not comprehensive and systematic.

(3) View as the problem without Gambling Theory

There are some literature on the port competition and cooperation, but, as a matter of fact, the whole construction of Shanghai international shipping center is a process of game which should be viewed with Game Theory. For example, the competition between Shanghai port and the ports around Yangtze Delta, the implementation of port privatization, opening shipping route etc. However, at present, the construction of Shanghai international shipping center can not be systematically analyzed with Game Theory.

(4) The quantitative analysis to international shipping center is insufficient

Qualitative research to the construction of Shanghai international shipping center is much more than quantitative study. At present, the quantitative research mainly focuses on port competitive forces. For example, Zhou Jiayou compared with shanghai and surrounding-country ports .His main task is to evaluate Shanghai, Hongkong, Singapore, Busan, Kaohsiung in both hardware and software environment in order to get Shanghai port advantage and disadvantage.

(5) The evaluation indicators of the quantitative research is non-comprehensive and non-uniform

At present, quantitative analysis of port economy mainly focused on container throughput prediction, using AHP to analysis port layout and hub site selection. However, such kinds of researches are far from enough. It is very necessary to analysis the problem in the course of Shanghai international shipping center construction with quantitative analysis. Meanwhile, the choice of measure indicators has not form a unified norm that means quantitative analysis of port economy is not very sophisticated and the conclusion is still a lack of comparability.

(6) There is few research on how to face this international financial crisis

Since 2008, the rapid spread of international financial crisis and slowdown in world economic development has greatly influenced international shipping market and our domestic shipping industry. However, as far as I learned, the researches on how does Shanghai international shipping center face this economy crisis is very few. Meanwhile, all of us know that economy is closely connected to the Shipping industry. However, there is very few quantitative research on its connection. That is the reason why research on the Shanghai international shipping center under financial crisis is very necessary.

In a word, international shipping center still has a lot of areas waiting us to explore deeply inside, especially quantitative research. At the same time, the financial crisis has greatly impact on the construction of Shanghai international shipping center. Therefore, research of Shanghai international shipping center still has a long way to go.

1.3 Research object, meaning and content

(1) Research objectives

International shipping center is developing very quickly in China. However, the

quantitative analysis on the construction of Shanghai international shipping center and research on re-position of Shanghai International Shipping Center under new situation are far from enough. The author want to establish evaluation index system of international shipping center to find out the position of shanghai international shipping center in the world and put forward the challenge and opportunity to the development of Shanghai international shipping center under the financial crisis, hoping to provide other research for reference.

(2) Meaning of selected topic

Shanghai international shipping center is a great and complex project, because a lot of subjects such as management science, economics, marketing science, system science etc will be put into use in order to ensure the research systematic, scientific and constructive. Therefore, research on the problem happened in the building of Shanghai international shipping center is very meaningful. This thesis sum up the international shipping center's basic concept and development process and put forward the development trend of international shipping market and an international shipping center under the new situation. In addition, research on Shanghai international shipping center can provide reference to building other shipping center in China such as Dalian and Tianjin and we also can well deal with competitiveness of regional shipping center.

Building Shanghai international shipping center is not just a matter of Shanghai, because it not only relate to whether shanghai port can become hub port of Northeast Asia but also relate to whether the cargo from Yangtze River Delta will be transited in other foreign port which will lead to a lot of foreign exchange. Furthermore, construction of Shanghai international shipping center means not only to promote the development of shipping enterprises and port economy but also to facilitate the

entire Yangtze River Delta's economic development. Therefore, construction of Shanghai international shipping center is a great event in China and the content of its study is also very constructive and meaningful.

(3) Content of research

This thesis summarized the basic theories and phylogeny of international shipping center firstly and proposed the development directions of international shipping market and shipping center in the new international circumstances. In addition, the article introduces the present situation about the construction of Shanghai International shipping center.

Based on the formation-process of international shipping center, this thesis focused on the influencing factors of international shipping center's construction, and formed an entire evaluation indicators system to analysis development of international shipping center .This system synthetically analyzed the construction of international shipping center both from foundational and soft environment constructions. This system also can be used as the evaluation evidence of the Shanghai international shipping center's position in the world.

In order to ensure the position and main competitors of shanghai international shipping center between shipping centers in being and building in East-Asia, this thesis classified some of East-Asia's shipping centers, which may threat the position of Shanghai, by the difference of total competitive power with the method of Principal Component Analysis and Clustering Analysis. It came to the conclusion that the construction of Shanghai has achieved partial achievement especially in hardware environment which has reached world class. In one side, after several years' development, Shanghai is potentially to be global international shipping

center as Singapore and Hong Kong. In another side, it is also threaten by the territorial shipping center as Busan, Kaohsiung and so on. Strategically, Shanghai should put itself to the location of global international shipping center, while Tianjin and Dalian take as the territorial shipping centers.

(4) Conclude the target and key problem of Shanghai international center's development. At preliminary stage, Shanghai has set the target of building international shipping center and got partial achievement after more than 10-year development. However, problems still existed especially this financial crisis has greatly influenced the construction of Shanghai international shipping center. Finally, the article gives some solution to the problems.

1.4 Methodology

There are two methods and one software being introduced into this paper. The two methods are Principal components analysis (PCA) and Cluster analysis（CA）. The software is Statistical Product and Service Solutions (SPSS).

Principal components Analysis is a statistical technique of changing the many variables in a data matrix so that the new components are correlated with the original components but not with each other; that is, so that they are now independent of each other. It is a technique used to change a set of original variables into a number of basic dimensions.

Cluster analysis is the assignment of objects into groups (called clusters) so that objects from the same cluster are more similar to each other than objects from different clusters. Often similarity is assessed according to a distance measure. Clustering is a common technique for statistical data analysis, which is used in many

fields, including machine learning, data mining, pattern recognition, image analysis and bioinformatics.

Statistical Product and Service Solutions (originally: Statistical Package for the Social Sciences) was released in its first version in 1968 after being founded by Norman Nie and C. Hadlai Hull. SPSS is among the most widely used programs for statistical analysis in social science. It is used by market researchers, health researchers, survey companies, government, education researchers, marketing organizations and others.

1.5 Structure of the research paper

Chapter 1 is introduction, literature review on some basic theory and concepts on international shipping center. Chapter 2 is overview about Shanghai international center. Chapter 3 is the comparison analysis between Shanghai and other famous international shipping center. The object and key problem of Shanghai international shipping center is subjected to Chapter 4. Chapter 5 draws the conclusion and some suggestions are recommended. The flow chart below indicates the whole structure of the research paper.

Chapter 2 Generality of international shipping center

2.1 The concept of an international shipping center

International shipping center is a comprehensive concept which should gather well-developed shipping financial markets, effective logistic system, great number of liner route etc and is always supported by the international trade, financial and economic center. At present, there are more than 2000 port cities in the world, however just a few cities are recognized as an international shipping centers among which Rotterdam, Hamburg, London, Singapore, New York and Hong Kong are the most famous. From world's shipping development, there are several views about international shipping center as followed.

(1) International shipping center is a developing concept. Three generations of international shipping center have formed during three centuries. The international shipping center in now days has developed into world general resource allocation center which collect and allocate the goods, capital, technology, information all over the world. A successful shipping center mode means that port and city should develop with each other. International trade, finance and shipping center are a unity which should be mutually dependent and collaboratively develop with each other.

(2) Forming an international shipping center generally has eight basic elements: well-developed hinterland, huge import and export volume, sound international shipping market, advanced zone bit, strategic location, excellent deep-water channel and port, perfect collect and distribute system, trustworthy international financial and trade center, adequate and systematic service, favorable legal and policy environment.

2.2 Development process of international shipping center

2.2.1 Space transfer of international shipping center

International shipping is solid support to international trade, on the other hand international trade is the engine of economic development, therefore space transfer of an international shipping center is with the development of world economic center. In the 16th century's global challenge adventure, some hub-port cities such as Lisbon, Antwerp, Amsterdam, London had gradually become the embryonic form of

international shipping center. Since the 18th century, world economy center had experienced three space transfer that is Mediterranean, Atlantic, Pacific sequentially and the international shipping center had formed in Western Europe, North America, East Asia and Southeast Asia etc accordingly.

Late 18th century to the early 19th century, when the industrial revolution broke out in Europe, London has become as an international economy and manufacturing center rapidly which promoted London to become the first generation of international shipping center. At end of the 19th century, the growth of The United States economy caused the world economy center to shift to North America which promoted the New York to become the second generation of international shipping center. New York, the United States' largest trading ports, was rapidly becoming the world's financial center and economic center. Since 1960’s, the economy of Japan and Asia's "four little dragons" developed very rapidly and the world economy center shifted from the Atlantic to the Pacific. The port cities in advantageous Pacific coast such as Singapore and HongKong became an international shipping center, because of abundant goods supply and good supporting policy and service.

2.2.2 The function evolution of an international shipping center

With the economy growth and transportation technology innovation, the structure of international shipping center has gone through from simple to complex, from low-level to advanced process, therefore the function has been continually optimized and upgraded. According to the UNCTAD, the modern port can generally be divided into three types: transformation，value-added by manufacture and resource allocation. Accordingly, the function of international shipping center also has experienced this

three phases.

First stage is from early 19th centuries to World War II. In this time, the main function of international shipping center was transit which formation always depends on the port location, natural conditions and level of industrialization in hinterland. At that time, the cities such as Rotterdam and London naturally evolved into early international shipping center in order to meet the rapid growth of international trade demand which provided collect and distribute service all over the world rather than initiatively take the control.

The second stage is after World War II. In this stage, the international shipping centers played very important roles in the world economy which not only extensively finish transportation and transit of goods but also achieve maximum value-added services by manufacture. Rotterdam, New York and London have all complete transition process and shifted into the second generation of international shipping center. Meanwhile, with the economic growth of Asia-Pacific, Singapore, Hong Kong, Tokyo become very important international shipping center of second generation. Most of these kinds of cities applied the preferential policy in order to attract supply and create a good environment for trade and investment. In addition, London, New York formed a distinctive feature relying on its economic, financial, insurance advantage. Since the seventeenth century, the establishment of the Baltic Exchange and Lloyd's Insurance made London be the central position and status in the global chartering market. New York become the typical representative of value-added international shipping center, because of its well- developed economy, insurance and finance. Hong Kong and Singapore make up their own weaknesses that their own market is not big enough and become the most dazzling international shipping center in the world relying on deep-water port, shipping

information consultation, perfect market system and free-port policy etc.

Since the 1980s, the third stage has begun. The port cities begun to gradually turn into resource-allocated international shipping center, because of the acceleration of world economy，science and technology. Compared with the other two phase international shipping center, the third phase made a great leap in function, influence and development mode. London, New York, Rotterdam, Hong Kong, Singapore, Tokyo are the pioneer of international shipping center in the third phase, however they have not fulfilled the complete function of third phase.

2.3 The development trend of international shipping center

2.3.1 Container hub port oriented

Global economic integration enables many countries not only increasingly depend on international trade but also raise the proportion of high value-added goods in international trade. In addition, using container is a good way to transport high value-added goods which can support to build up a trade center. Therefore, international shipping center correspond with the trade center should view building up International container hub port as core business. The container throughput of world's leading international shipping center such as Singapore, Hong Kong, Rotterdam and Los Angeles is in a very high ranking.

2.3.2 More and more hardware requirements on the port

(1) Deep-water port

The alliance among the shipping company and the economies of scale enables the vessels to get bigger and bigger. Therefore, the large- scale container vessels demand the port water deeper and deeper and depth of water is decisive factor of building international shipping center which greatly influence the capacity of collection, distribution and transportation. Ports can take the initiative in the competitiveness of an international shipping center only if they have the deep-water capacity to call the new generation container vessels. Accordingly, deep-water berths are one of the development trend of an international shipping center. As the ports of an international shipping center, they should have the capacity to call the fifth of sixth generation container vessels.

(2) Large-scale port

Faced with increasing competition, the ports of international shipping center continued to expand the port scale to reduce costs and improve economic benefit. Consequently, large scale of the port is also another trend of international shipping center's development.

(3) Effective and efficient port handling

Large-scale vessel and the transform of liner shipping operations put forward high requirement of port handling. Meanwhile, faced with the development of E-commerce, the port of international shipping center will continue to improve operating efficiency in order to shorten the time of berthing. Moreover, improving cargo handling technology and operational efficiency can deal with the port

throughput in growing numbers. Therefore, the growth mode of future international shipping center will turn into pursuing the berth efficiency from pursuing the berth quantity.

(4) Port informationization

The port of international shipping center should not only deal with huge amount of cargos in short time but also process a lot of information including some documents and files. Therefore, port is not only a capital-intensive place, but also information-intensive industry. At the same time, information communication between international shipping center and other sectors such as financial center and trade center should also have safer and quicker security.

(5) Free port

The most famous international shipping center implement preferential or free port policy to attract foreign investment. Therefore, the customs there is to balance the whole country or region's economic development, carry out international trade and take as simple procedure as possible in order not to delay the transportation rather than levy tax through the supervision. Hong Kong and Singapore, the entire city is free port city which virtually has no control and low tax rate on import and export trade. In addition, the two cities have given as much as possible convenience in customs procedures and inspection, storage and operation procedures etc. In Rotterdam, a variety of merchandise except for drugs and arms can be freely stored, re-exported, processed, packaged and sold. Such a loose policy attracted a large number of transit container which account for about 60% throughput every year. Although there is no free port in the United States, it has bonded area in port where cargo can be processed and stored freely and the goods should be levied only when entering into the American market. Free port and bonded zone has increasing

become international hub, distribution and trade center. Furthermore, multinational companies are more willing to make extensive use of free port and bonded zone to promote international strategy and form layout. Therefore, we can clearly see that these policies enhance the attractiveness of an international shipping center.

(6)Trade, finance and hinterland support

Taking a panoramic view of the world's major international shipping center such as London, New York, Hong Kong, Singapore and Los Angeles, you will find that trade center and financial center plays a very critical roles in supporting international shipping center. International trade, financial and shipping center are always interdependent and develop with each other. There is no doubt that London and New York are the world's top two international financial and trade center. Securities and foreign exchange transactions in London is in a leading position which loan amounts and volume of foreign exchange transactions account for about 1/5 and 1/4 of the whole world respectively and New York is in the world's second rank second only to London. Hong Kong and Singapore are Asia's most powerful financial and trading center which plays an important role in the world finance and trade market. It is necessary to be noted here is that although the container throughput in London is not huge enough compared with other international ports and New York’s container throughput rank is only about 15, the two cities were still recognized as an international shipping center because of their strong financial and trade supporting environment.

(7) An increasing port competition

Nowadays, many port cities propose to build an international shipping center so as that international container hub port’s competition is more and more fierce. In Europe, central Europe is the main battlefield of port competition. At present,

Rotterdam and Hamburg bid to become the hub port in central Europe. In the Far East, the region from Japan to the Straits of Malacca has formed container port group including Hong Kong, Singapore, Kaohsiung, Busan, Kobe etc. With the change of global liner route pattern, the competition is becoming fiercer and fiercer. Hong Kong and Singapore are making great effort to expand and build modern and efficient container terminal in order to keep the leading position. In addition, some international port cities such as Shanghai also want to seize the initiative to become an international shipping center firstly. However, Shanghai is facing huge threat from Kaohsiung, Busan and Kobe. Therefore, when more and more countries are paying more attention and investment to the construction of an international shipping center, it is more and more difficult for them to get this position.

2.4 Current situation of Shanghai international shipping center

With more than 10 years' construction and development, Shanghai international shipping center began to take shape. The achievement is listed as followed.

2.4.1 Basic environment

(1) The opening of YangShan deep-water port phase I in December 2005 not only puts an end to deep-water port in Shanghai but also greatly enhances the competitiveness of Shanghai port in East Asia. From the port infrastructure perspective, according to the plan, completing YangShan deep-water port construction will be divided into 3 phases. Phase 1 was completed in 2005, it built 1600 m coastline with 5 container berths and terminal capacity has reached 2,200,000 TEUs per year. At the same time, the Donghai Bridge which total length is about 32.5 km and supporting facilities Luchaogang Railway Station Terminal

were also finished. Phase 2 will be completed in 2010, focusing on raising the grade of berth and forming 350-400 million TEU throughput. Phase 3 will be completed in 2012, it will build 18km coastline with more than 50 super-panamax berths and terminal capacity will achieve 2000 million TEU per year.

(2) With the opening of Yangshan port and starts operations, Shanghai has become the biggest port in China with the highest route density and most extensive port coverage.

As of June 2006, container vessels in Shanghai port breakthrough 2000 per month and cover more than 300 ports worldwide. According to data，container throughput of Shanghai port in 2007 completed 26.15 million TEUs, increased by 20.5% over the same period of last year. However, the container volume of Shanghai Port mainly depends on the hinterland economy, the transit containers only account for 3% of all the volume.

(3) The construction of Shanghai International Shipping Center drives the ports integration and joint development in the Yangtze River Delta port area. At present, the ports' throughput in Yangtze River Delta region accounted for 40% of the total national volume.

2.4.2 Soft environment

(1) Customs clearance efficiency

After a several years reform, custom clearance efficiency and service has been improved a lot. Shanghai Customs has fully implemented "Remote reporting, Port clearance" and EDI customs clearance which can greatly improve the service

efficiency and paperless operations. At present, customs clearance in Shanghai Port reduces an average of 0.9 day to 0.73 day.

(2) Information data platform

Shanghai government coordinates the relationship between customs, commodity inspection, trade, taxation and other government departments and integrate the original Shanghai EDI Center, Shanghai port EDI center and Shanghai Trade Network Technology Company to establish Yitong network(www.easipass.com) which greatly improve information asymmetry between different department. Yitong network allows users can not only easily see the business procedures of various departments and real-time latest policies and regulations of the sector, but also can get customs declaration, the tax refund checks and registration manual etc on time.

(3) The reform of examination and approval system

Shanghai continues to reform examination and approval system in order to create a more relaxed environment for investors home and abroad. For example, Shanghai has fully simplified the administrative examination and approval reducing 128 approval items to 69 in bonded zone. At the same time, approval time of enterprise access to bonded zone reduces 1 month to 3 working days and construction item reduce half an year to within 40 working days.

(4) The adoption of advanced management

While Shanghai international shipping center has achieved phased results, central government has proposed to build Dalian and Tianjin international shipping center. In December 2005, Shanghai Yangshan Bonded area approved (8.14 square kilometers), In October 2006, Dalian Dayaowan and Tianjin Dongjiang Bonded Zone are also approved respectively (6.88 square kilometers and 10 square

kilometers). According to "Eleventh Five-Year Plan", China will gradually build the three major shipping centers Shanghai, Tianjin and Dalian.

Chapter 3 Study about the comparison between Shanghai and other famous international shipping centers

3.1 Overview about famous international shipping center

The formation of an international shipping center can be divided in to three stages. The first phase focused on basic environmental construction which can be called basic environmental construction period. The second phase focused on the construction of soft environment which is called soft environment construction period. The third phase focused on the specific operation of an international shipping center which is called the operation period. These three stages develop step by step and have different focus.

Basic environment includes two aspects. The first is the natural environment and

infrastructure for the port development and operation. The second refers to the port city overall economic and social development including port city's gross national product, foreign trade volume etc. Basic environment is relatively stable, because it is largely restricted by the port condition and economic development. Apart from the basic environment, the factors that impact the construction and operation of international shipping center are the soft environment. Soft environment is less affected by the natural environment, therefore it is relatively independent and flexible.

3.1.1 Basic environmental construction

There are a lot of basic environmental factors that influence the competitiveness of an international shipping center which can be summarized into the following five main factors.

That is port natural condition, port production technology, collection, distribution and transportation system, the economic environment of hinterland, port capacity for sustainable development.

(1) Port natural conditions

Natural conditions are very important to the development of container ports. If a port city wants to become an international shipping center, it must be in the international strategic location and have an excellent deep-water waterways and unique natural port conditions.

It includes the following main aspects: ① Meteorological and climatic conditions; ② Probability of natural disasters; ③Port hydrology; ④ Width and depth of

waterway; ⑤ Distance between port and international shipping route

(2) Port production technology

Port production technology is one of the most direct factors that impact the development of building an international shipping center. It includes the following aspects: ① The current throughput of the port ②Growth rate of port throughput ③Technical level of terminal equipment ④Water depth and length of front berth ⑤ Yard storage capacity.

(3) Collection, distribution and transportation system

Port collection, distribution and transportation system directly affects whether the cargo can successfully access to the hinterland and decide the scope of hinterland. It includes the following aspects: ① Land Transport Network ② Air Transport Network ③ Water transport network ④ Near-sea shipping liner situation;⑤ International ocean route situation; ⑥ Multimodal transportation level. At present, road transport, railway transport and multimodal transport are the main business of port collection distribution and transportation system.

(4) Economic environment of hinterland

Commodity supply is one of the main factors influencing the economic environment of hinterland. Some main factors that affect the commodity supply including hinterland's growth rate of the economy, development of foreign trade, industry and product structure and economic policy.

(5) Sustainable development of port

Sustainable development of port directly impacts on the future capacity development level of international shipping center. Some main factors that influence the

sustainable development of port are reserved quay and area for building port.

3.1.2 Soft Environment Construction

Soft environment can be divided into two parts: government soft environment and economic soft environment. Government soft environment includes legal environment, government policy environment and government agencies service environment etc.

(1) The government soft environment

1) Legal environment

Legal environment mainly refers to the legislation and enforcement. Local government legislation can be in accordance with national law and the region's economic development. Legislation can adjust the interests between region with other regions, the government and the individuals.

2) The policy environment

Policy environment means government takes measure to increase or reduce the main interest of the market according to the local economy conditions. Policy is drawn up by the government which can be divided into restrictive policies and encourage policy. Restrictive policy is that the government put forward the restrictions, penalties and fees to some market activities. Encourage policies means the government take the measure to provide support, assistance and return of taxes to some market activities.

3) Government agencies services

Government agencies provide the services including service functions, service quality, service efficiency, service cost and attitude. The benefits of enterprise largely depend on the quality of government services. Comprehensive government services can reduce errors in decision-making, business risk, the expenditure and save the cost of enterprise. In addition, compared with policy, government services can form a unique soft environment in the specific region.

(2) Economic soft environment

Economic software environment refers to the regional soft conditions that affect the people's economic behaviour and decision-making besides the governmental software environment.

1) Shipping market environment

Market environment refer to the economies operation and structure in the market. The status of market economy operation can be divided into embryonic stage, rapid development stage and mature stage. Indicators to measure market structure are dispersion of industry, concentration of industry and market entry barriers.

Shipping market must fulfill the functions as followed: 1) The resource allocation function.

2) Financial environment

Financial environment is the state of the financial services in a region which includes freedom of currency exchange, convenience of settlement and clearing and channels of investment and financing. Any enterprise economic activities can not be separated from the flow of money, therefore the financial environment for enterprise especially for foreign-funded enterprises is important. Well-developed financial sector provides a convenient and powerful protection for the rapid development of

the shipping industry. The development of international shipping industry should be supported by the financial services sector such as Hong Kong it is a shipping finance center. The shipping industry is a capital-intensive industry. Therefore, financial development will further expand the financing channels for the shipping industry and solve funds shortage of shipping company and port sector.

On the other hand, transportation itself is also process of fund flow. Therefore, improvement of the financing environment will be conducive to the domestic and international capital flow and market development which provide sufficient capital to the shipping industry. Shipping industry is the high-risk industries, therefore insurance services is essential industry. Well-developed insurance industry, plenty insurance products and order insurance market guarantee the development of the shipping industry.

3) The information service environment

With the rapid development of market economy, information has become an important deciding factor. Convenience of accessing to information and searching information costs has become main indicators in a regional business environment. Shipping market, gradually formed a tendency that relay on a logistics center and information Center as the rapid development of today's global information. London in the development of more than 300 years has been established the world's shipping information center. For example, Lloyd's Register enjoys high reputation in shipping information sector. Database of Lloyd's Information Services has 80,000 vessels information and 35,000 of them are tracked dynamically. For the shipping industry, information has promoted the shipping market and enhanced the quality of port services in the following areas:① The shipping information can maintain the stability of the shipping market and ensure the efficiency of the price mechanism which can promote the shipping transaction.② Finance, trade and shipping

information make the shipping and port enterprises learn the market trend and related regulations and policies immediately which can enhance the market transparency and reduce operational risks.③ The smooth flow of shipping information guarantees the safety and efficiency of shipping.④ The application of information system improves the quality of shipping industry service. Many large shipping companies, according to its own needs, establish the internal management information systems and then establish a global computer network through modern communication technology which can realize the company's fleet tracking and tracing. In addition, the application of information system can control shipping operations to enhance the quality of service.

4) Human resources environment

Human resources environment includes the number of available talent, talent quality and labor costs. In regional competition, there is growing emphasis on the merits and demerits of soft environment. As excellent soft environment can not only reduce business costs and risks, but also make up for the deficiencies of regional hard environment.

1)) Human resources can make up for lack of material resources

In social production, workers are the most important decisive factor in productivity and talents are high-quality workers. Therefore, human resources is the most valuable and important resources of all the resources which can make up for the shortage of material resources through its unique high-level initiative.

2)) High-quality human resources can play a multiplier effect on economic growth

Improving worker quality that is actually to increase workers' scientific and technological knowledge and enhance their working skills. The improvement of

workers skills can play a multiplier effect on economic growth. During the period from 1900 to 1957, American physical capital investment increased 4.5-fold and profits increase 3.55-fold, but human capital investment increased 3.5-fold and profits increase 17.55-fold. In addition, developed in science and technology today, high-quality human resources effect is far more than 1957's. The total effected factor of international shipping can be concluded in figure 3-1.

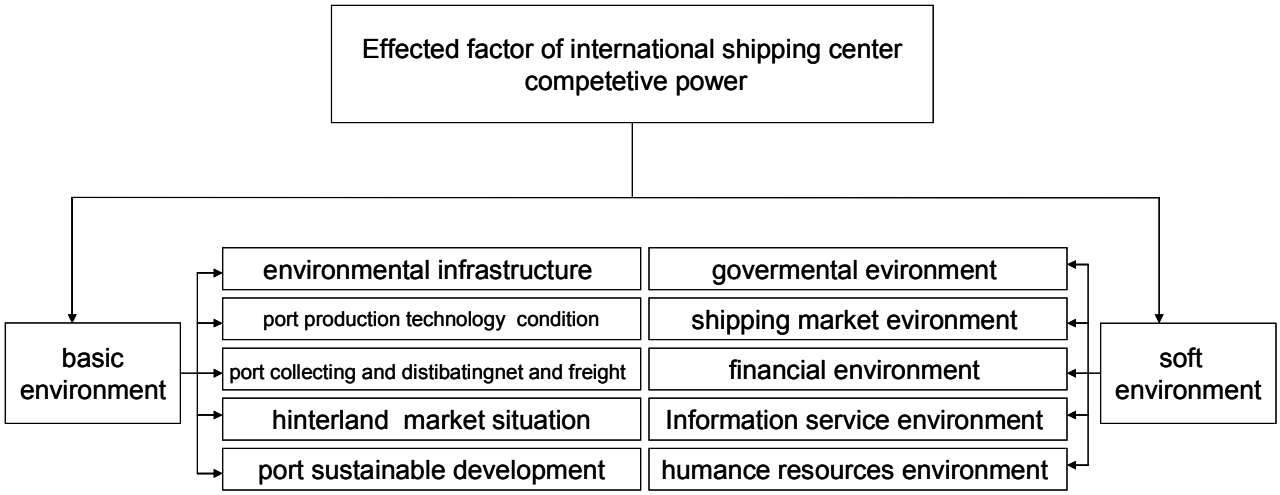

Figure 3.1 Influencing factors of international shipping center's competitive power

3.2 Forming evaluation indicator system to international shipping center

The basis environment and soft environment which are the two phrases of construction in the formation of international shipping center are made as the one class index, and then the five important factors of each phrase are made as two class index.

In order to better compare Shanghai and other international shipping center's performance. Therefore based on two class index, some specific factors are made as three class index.

Table 3.1 Evaluation Indicators System of international shipping center's competitive power

One class index	Two class index	Three class index
The basic environmental indicators	Port production technology	The number of container berths
		Container throughput (million TEU / year)
		Total number of Crane
		The current container throughput (million TEU)
		The average annual growth rate of container throughput in the past five years (%)
		The proportion of transit container (%)
	Natural and geographical condition of port	water depth of quayside apron (m)
	Collection and distribution capacity and freight rates	Collection and distribution capacity (1-9)
		Business costs per container(USD / TEU)
	Economic conditions in hinterland	Port city GDP (100 million U.S. dollars)
		Resident population (million)
		The average annual GDP growth rate in the past five years (%)
		Total foreign trade/ GDP (%)
	Port sustainable development capacity	The number of container berths expected in 2010
Soft environmental indicators	Government environment	The extent of tariff system(1-9)
		Government revenue/GDP (%)
	Shipping market environment	Container liner density (liners/month)
		Navigation coverage
		Logistics services capacity (1－9)
		Market adaptability (1－9)
	Financial environment	Financing environment (1-9)
		The number of insurance companies
		Premium income (million)
	Information service environment	Internet users (10,000)
		Mobile phone popularizing rate (%)
		The level of information (1-9)
	Human resources environment	Social workers (million)

		The proportion of undergraduate or above

3.3 Evaluation on the construction of Shanghai international shipping center

The selection of international shipping center that compared with Shanghai should consider the following factors:

(1) Location factors

The object in this paper is the position of Shanghai international shipping center. From the point of geographical location of Shanghai port, the selection of international shipping center that compared with Shanghai should be close to Shanghai port.

(2) The level of international shipping center construction and development

With the development of East Asian economy and trade, especially China's sustained and rapid economic growth, the East Asian region has become the most economic active area in the world. The world maritime transportation pattern is Europe , north American and east Asia used to equally share a pie but now east Asia holds one half of the total market share, Europe and north America occupy the rest. Such a significant change can be seen from table3-2.

Table 3.2 Rank of the throughput of world's first ten container port from 1998-2008

(Unit: ten thousand TEU)

Year	1	2	3	4	5	6	7	8	9	10
1998	Singapore 1530	Hong Kong 1458	Kaohsiung 635	Rotterdam 601	Pusan 575	Long Beach 409	Hamburg 354	Los Angeles 354	Antwerp 327	Shanghai 307
1999	Hong Kong 1621	Singapore 1594	Kaohsiung 699	Rotterdam 640	Pusan 631	Long Beach 441	Shanghai 422	Los Angeles 383	Long Beach 374	Antwerp 361

2000	Hong Kong 1810	Singapore 1704	Pusan 754	Kaohsiung 743	Rotterdam 630	Shanghai 561	Los Angeles 488	Long Beach 460	Hamburg 425	Antwerp 408
2001	Hong Kong 1780	Singapore 1552	Pusan 807	Kaohsiung 754	Shanghai 633	Rotterdam 609	Los Angeles 518	Shenzhen 508	Hamburg 469	Long Beach 446
2002	HongKong 1914	Singapore 1680	Pusan 945	Shanghai 861	Kaohsiung 849	Shenzhen 761	Rotterdam 652	Los Angeles 611	Hamburg 537	Antwerp 478
2003	HongKong 2000	Singapore 1810	Shanghai 1128	Shenzhen 1065	Pusan 1040	Kaohsiung 885	Los Angeles 718	Rotterdam 700	Hamburg 600	Antwerp 545
2004	HongKong 2193	Singapore 2060	Shanghai 1455	Shenzhen 1365	Pusan 1143	Kaohsiung 971	Rotterdam 830	Los Angeles 372	Hamburg 700	Dubai 643
2005	Singapore 2320	HongKong 2242	Shanghai 1808	Shenzhen 1620	Pusan 1184	Kaohsiung 947	Rotterdam 930	Hamburg 810	Dubai 762	Los Angeles 742
2006	Singapore 2480	Hong Kong 2323	Shanghai 2171	Shenzhen 1846	Pusan 1203	Kaohsiung 977	Rotterdam 960	Hamburg 890	Dubai 878	Los Angeles 846
2007	Singapore 2790	Shanghai 2615	Hong Kong 2388	Shenzhen 2110	Pusan 1327	Dubai 1605	Kaohsiung 1026	Qingdao 946	Ningbo 938	Guang Zhou 920
2008	Singapore 2992	Shanghai 2801	Hong Kong 2430	Shenzhen 2142	Pusan 1342	Dubai 1200	Guang Zhou 1100	Ningbo 1084	Rotterdam 1083	Qingdao 1002

(Date source: China Statistical Yearbook)

From table 3.2, it can be easily found that the shipping industry in East Asia is very outstanding. In 1998, Port in East Asia accounted for 5 of the world top 10 and this number has grown up to 8 in 2008. Based on the prosperity of shipping industry in East Asia, major ports competition in East Asia is increasing and the position is also rapidly changing. From 2003 to now, Shanghai port has maintained the third position which shows that after ten years of construction Shanghai International Shipping Center has achieved initial success.

In the light of the above two considerations, Singapore, Hong Kong, Kaohsiung and Busan are viewed as foreign center compared with Shanghai. Singapore and Hong Kong represent the world-class international shipping center and Kaohsiung and Busan are viewed as the representative of developing shipping center. In addition, according to our government guide line Dalian and Tianjin will also build into an international shipping center. Therefore, the both will be listed into comparison objective which represent the initial stage of the international shipping center. Every ports current level and development goals can be seen in table3-3.

Table 3. 3 Available conditions and development targets of Shanghai and other competitive ports

Port	Container throughput in 2008 (ten thousand TEU)	Development target
Singapore	2992	----
Hong Kong	2430	----
Kaohsiung	947	Asia-Pacific shipping center
Pusan	1342	Pacific and North East Asia hub port
Shanghai	2801	International shipping center
Dalian	545	North East Asia hub port
Tianjin	850	Regional shipping center

3.3.1 Basic data to Shanghai International Shipping Center's position

Based on the evaluation indicator system, and taken full use of Statistical Yearbook and related Websites, the original date has been collected. Because of some date is not available and has not been released, the calculation in this paper is based on the indicators and data as followed table 3.4:

Table 3.4 Basic data for the clustering research of international shipping center

Index	Singapore	Hongkong	Kaohsiung	Pusan	Shanghai	Dalian	Tianjin
water depth of quayside apron (m)	13.1	15.5	14	15	15	12	15
The number of container berths	30	24	28	25	28	9	9
Container throughput capacity (million TEU / year)	1300	1800	880	616	1055	250	355
Total number of crane	92	85	73	59	103	16	40
The current container throughput (million TEU)	2320	2250	947	1184	1809	268.8	480.1
The average annual growth rate of container throughput in the past five years (%)	6.73	4.44	5.13	9.53	26.6	21.8	22.98
The proportion of transit container (%)	80	70	40	50	25.3	7.2	4.8
Business costs per container(USD / TEU)	212	322	107	100	106	75	82
Port city GDP (100 million U.S. dollars)	1944	1782.6	362	680	1131	266.1	453
Resident population (million)	435.14	693.6	151.04	365.78	1778	565.3	1043
The average annual GDP growth rate in the past five years (%)	6.2	6.4	2.08	5.5	11.6	14.18	12.5
Total foreign trade/ GDP (%)	196.76	162.81	59.94	16.45	65.00	46.75	60.47
Tertiary industry/GDP(%)	62.7	90.6	73.6	59.1	50.02	45.2	41.5
The number of container throughput expected in 2010	3100	2790	1080	804	3000	1000	1075
The extent of tariff system(1-9)	9	9	7	7.6	8	5.8	6
Government revenue/GDP (%)	15.7	17.5	13.8	8.3	15.96	9.4	10.8
Container liner density (liners/month)	2020	1928	1560	1460	1996	300	360
Navigation coverage	500	210	173	186	194	74	73

Logistics services capacity (1—9)	8.7	8.5	7.2	7.3	8	5.7	5.8
Market adaptability (1—9)	8.5	8.7	7	7.6	8.3	5.7	5.7
Financing environment (1-9)	9	9	7.4	7.5	8.5	4.5	5
The number of insurance companies	89	180	57	50	70	21	15
Premium income (million)	630.54	1282.9	339.94	652.7	333.62	52.6	81
Internet users (10,000)	221.4	490	100.21	223	663	104.9	270
Mobile phone popularizing rate (%)	85.25	110.4	130.5	70.1	96.7	42.4	41.7

（Date source: China Statistical Yearbook）

3.3.2 Analysis to the position of Shanghai International Shipping Center

（1）Principal component analysis

According to the indicators and data above, calculate the principal components with SPSS statistical software and get the result as followed:

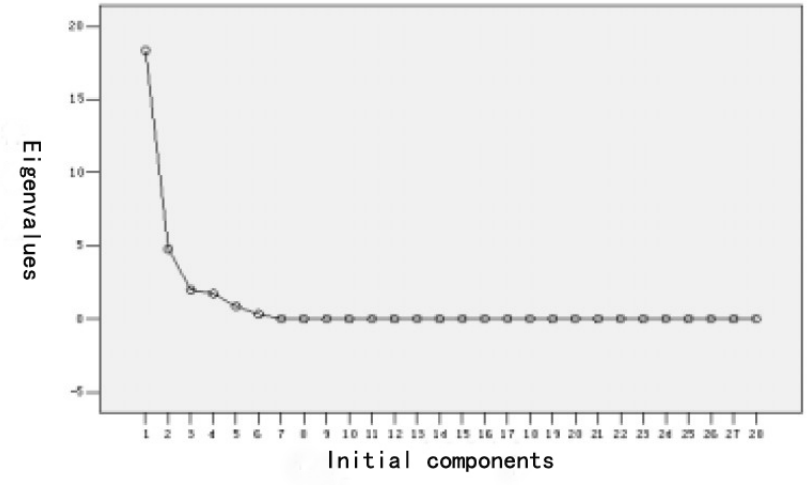

Figure 3.2 Figure Initial components and eigenvalues

Figure3.2 shows the eigenvalues of initial components calculated by the software. From this figure can be found that the eigenvalues sharply decreased with the increase in the number of initial components and begin in the sixth eigencalues is

close to zero. Generally, one always be the separatrix of eigenvalues.

Table 3.5 Eigenvalue and cumulative contribution of initial components

Initial components	Eigenvalues	Contribution (%)	Cumulative contribution (%)
1	18.290	65.322	65.322
2	4.800	17.143	82.465
3	1.990	7.109	89.574
4	1.735	6.198	95.772
5	.844	3.016	98.788
6	.339	1.212	100.000

From table 3.5 it can be easily found the first four eigenvalues are bigger than one and which cumulative contribution rate has reached 95.772%. Therefore, choose the first four initial components as the indicators of cluster analysis. The principal component showed in table 3.6.

Table3.6 Initial components of each port

Port	Initial components	Initial components 2	Initial components 3	Initial components 4
Singapore	1.03608	-.34926	1.63266	-.95871
Hong Kong,	1.27643	.07751	-.12896	1.84649
Kaohsiung	.03518	-1.18226	-1.07929	-.51638
Pusan	-.10742	-.7288	-.89482	-.41606
Shanghai	.28461	1.87772	-.58584	-.87764
Dalian	-1.35183	-.27802	1.00309	.32693
Tianjin	-1.17305	.58311	.05316	.59537

Figure 3.3 is a scatter plot through Principal component analysis. From this figure can be found that the vast majority of indicators are pooled in a plane except two indicators which says using such 28 indicators is very reasonable.

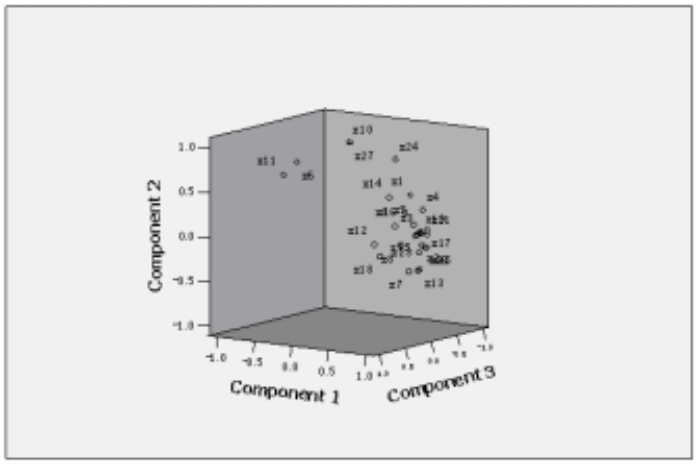

Figure 3.3 Indicators' geometrical distribution after principal component analysis

(2) Cluster analysis

When conducting the Cluster analysis with the result of calculation above and SPSS statistical software, the operational results can be got as followed.

Table 3.7 Proximity matrix of clustering analysis

Port	1: Singapore	2: HongKong	3: Kaohsiug	4: Pusan	5: Shanghai	6: Dalian	7: Tianjin
1:Singapore	1.000	.887	.536	.389	.525	.067	.000
2:Hong Kong	.887	1.000	.470	.332	.597	.010	.039
3:Kaohsiug	.536	.470	1.000	.989	.096	.472	.324
4: Pusan	.389	.332	.989	1.000	.109	.596	.469
5: Shanghai	.525	.597	.096	.109	1.000	.280	.475
6:Dalian	.067	.010	.472	.596	.280	1.000	.977
7:Tianjin	.000	.039	.324	.469	.475	.977	1.000

	7: Tianjin		6: Dalian		4: Pusan		3: Kaohsiung		5: Shanghai		2: Hong Kong		1: Singapore
1	X	X	X	X	X	X	X	X	X	X	X	X	X
2	X	X	X	X	X	X	X		X	X	X	X	X
3	X	X	X		X	X	X		X	X	X	X	X
4	X	X	X		X	X	X		X		X	X	X
5	X	X	X		X	X	X		X		X		X
6			X		X	X	X		X		X		X

Figure 3.4 Vertical Icicle

According to the figure 3.4 Vertical icicle and table 3.7 Clustering analysis, the result can be found as followed:

When 0.989 ＜ λ ≤1 :

{ Singapore },{ HongKong },{ Shanghai },{ Kaohsiung },{ Pusan },{Tianjin},{Dalian}

When 0.977 < λ ≤ 0.989:

{ Kaohsiung,Pusan },{ Singapore },{ HongKong },{ Shanghai },{Tianjin},{Dalian}

When 0.887 < λ ≤ 0.977:

{ Kaohsiung, Pusan }, {Tianjin, Dalian}, { Singapore },{ HongKong },{ Shanghai }

When 0.561 < λ ≤ 0.887 :

{ Singapore，HongKong }，{ Kaohsiung, Pusan}, {Tianjin,Dalian}, {Shanghai}

When 0.465 ＜ λ ≤0.561:

{ Singapore, HongKong，Shanghai }, { Kaohsiung, Pusan,}, {Tianjin,Dalian}

When 0.234 ＜ λ ≤.465:

{ Singapore, HongKong，Shanghai }, { Kaohsiung, Pusan, Tianjin, Dalian}

When λ≤ 0.234:

{ Singapore },{ HongKong },{ Shanghai },{ Kaohsiung },{ Pusan },{Tianjin},{Dalian}

From the above analysis, figure 3-5 can be got as followed:

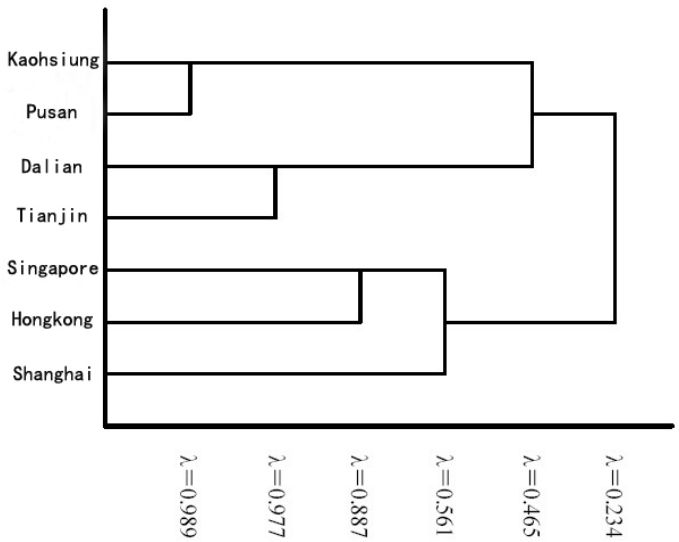

Figure 3.5 Clustering pedigree of total competitive power of international shipping center

From the result of analysis to Shanghai International Shipping Center, it is the most reasonable to show the position of Shanghai international shipping center, when λ is between 0.561 and 0.887. At this time, the international shipping center can be divided into four levels: { Singapore，HongKong }, {Shanghai},{ Kaohsiung, Pusan }, {Tianjin,Dalian} (The order according to their competitive strength).

Singapore and Hong Kong is the world- recognized international shipping center, so it is no doubt they are in the first level and there is quite a gap between Shanghai and these world-class shipping center. In addition, from the result of cluster analysis, Shanghai international shipping center has advanced Busan and Kaohsiung and been in the second level alone which shows that Shanghai international shipping center has achieved initial success in this 10 years construction. Tianjin and Dalian International Shipping Center has just started and now is in the fourth level.

When λ is between 0.465 and 0.561, Shanghai will be in the first level with Hong

Kong and Singapore which notes that Shanghai has a very large development potential and space.

3.3.3 Analysis to the position of Shanghai international shipping center's basic environment

（1）Principal component analysis

According to the indicators and data above, calculate the principal components with SPSS statistical software the result is got as followed:

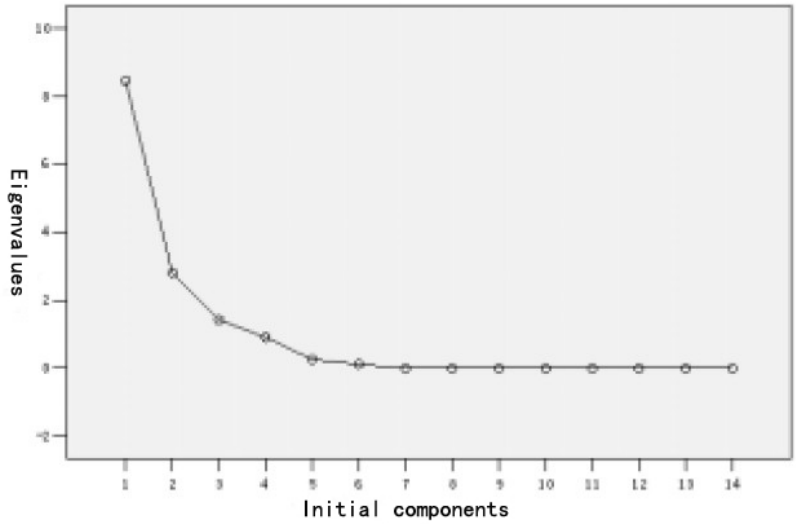

Figure 3.6 Initial components and eigenvalues

Figure3.6 shows the eigenvalues of initial components calculated by the software. From this figure can be found that the eigenvalues sharply decreased with the increase in the number of initial components and begin in the sixth eigencalues is close to zero. Generally, one always is the separatrix of eigenvalues.

Table 3.8 Eigenvalue and cumulative contribution of initial components

Initial components	Eigenvalues	Contribution (%)	Cumulative contribution (%)
1	8.463	60.448	60.448

2	2.812	20.089	80.537
3	1.426	10.187	90.724
4	.913	6.521	97.245
5	.264	1.885	99.130
6	.122	.870	100.000

From table 3.8, it can be easily found the first four eigenvalues are around one and which cumulative contribution rate has reached 97.245 %. Therefore, choose the first four initial components as the indicators of cluster analysis. The initial component showed in Table 3.9.

Table 3.9 Initial components of each port

Port	Initial components	Initial components	Initial components	Initial components
Singapore	1.12496	.05111	-1.1992	-1.17841
Hong Kong,	1.3494	.04863	-.21903	1.69233
Kaohsiung	.05942	-1.35106	.78033	-.52698
Pusan	-.19829	-.84926	1.00277	-.12774
Shanghai	.0463	1.78383	.94633	-.73857
Dalian	-1.31766	-.17041	-1.41201	-.07081
Tianjin	-1.06412	.48715	.10081	.95017

Figure 3.7 is a scatter plot through Principal component analysis. From this figure can be found that the vast majority of indicators are pooled in a plane except two indicators which says using such fourteen indicators is very reasonable.

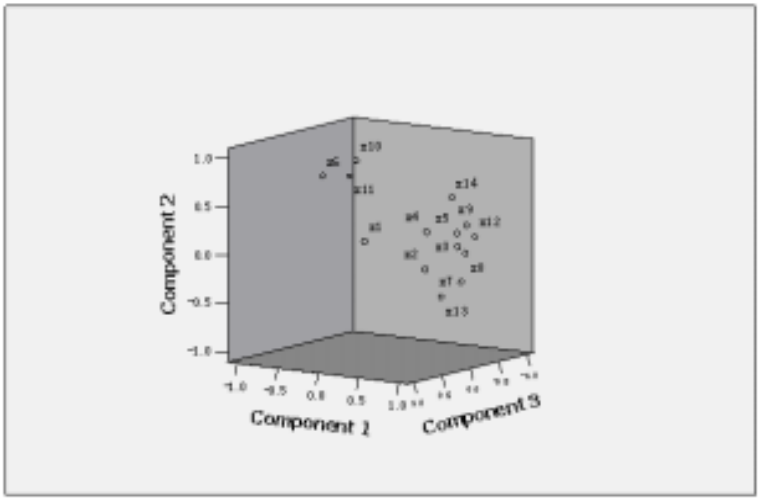

Figure3.7 Indicators' geometrical distribution after principal component analysis

(2) Cluster analysis

When conducting the Cluster analysis with the result of calculation above and SPSS statistical software, the operational results can be got as followed.

According to the Vertical icicle and Clustering pedigree, the result can be found as followed:

Table 3.10 Proximity matrix of clustering analysis

Port	1: Singapore	2: Hongkong	3: Kaohsiung	4: Pusan	5: Shanghai	6: Dalian	7: Tianjin
1:Singapore	1.000	.725	.506	.460	.654	.305	.347
2: Hongkong	.725	1.000	.713	.748	.681	.657	.791
3: Kaohsiung	.506	.713	1.000	.978	.741	.152	.646
4: Pusan	.460	.748	.978	1.000	.814	.323	.784
5: Shanghai	.654	.681	.741	.814	1.000	.540	.799
6: Dalian	.305	.657	.152	.323	.540	1.000	.826
7: Tianjin	.347	.791	.646	.784	.799	.826	1.000

	7 Tianjin		6 Dalian		5 Shanghai		4 Pusan		3 Kaohsiung		2 HongKong		1 Singapore
1	X	X	X	X	X	X	X	X	X	X	X	X	X

2	X	X	X		X	X	X	X	X	X	X	X	X
3	X	X	X		X	X	X	X	X		X	X	X
4	X	X	X		X	X	X	X	X		X		X
5	X	X	X		X		X	X	X		X		X
6	X		X		X		X	X	X		X		X

Figure 3.8 Vertical icicle

According to the figure 3.8 Vertical icicle and table 3.10 Clustering analysis, the result can be found as followed:

When 0.978 ＜ λ ≤1 :

{ Singapore },{ HongKong },{ Shanghai },{ Kaohsiung },{ Pusan },{Tianjin},{Dalian}

When 0.826 < λ ≤ 0.978:

{ Kaohsiung,Pusan },{ Singapore },{ HongKong },{ Shanghai },{Tianjin},{Dalian}

When 0.778 < λ ≤ 0.826:

{ Kaohsiung, Pusan }, {Tianjin, Dalian}, { Singapore },{ HongKong },{ Shanghai }

When 0.725 < λ ≤ 0.778 :

{ Kaohsiung, Pusan, Shanghai}, {Tianjin, Dalian}, { Singapore },{ HongKong }

When 0.627 ＜ λ ≤0.725:

{ Singapore, HongKong }, { Kaohsiung, Pusan, Shanghai}, {Tianjin, Dalian}

When 0.535< λ ≤ 0.627 :

{ Singapore, HongKong ,Kaohsiung, Pusan, Shanghai}, {Tianjin, Dalian}

When λ ≤ 0.535 :

{ Singapore },{ HongKong },{ Shanghai },{ Kaohsiung },{ Pusan },{Tianjin},{Dalian}

From the above analysis, Clustering pedigree can be got as followed. Figure 3.9

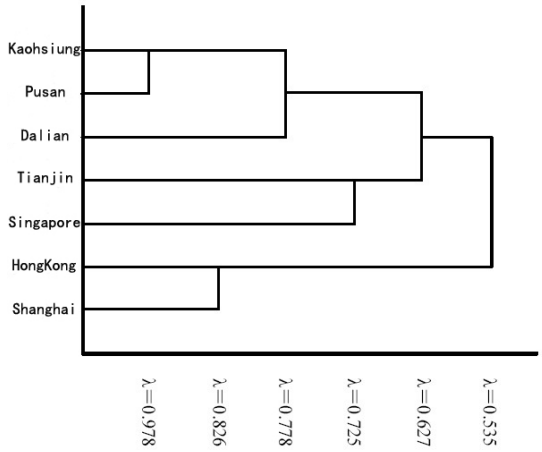

Figure 3.9 Clustering pedigree of basic environment competitive power of International shipping center

Combining the results of cluster analysis and all the shipping center's construction level, it is the most reasonable when λ is between 0.535 and 0.627({ Singapore, HongKong ,Kaohsiung, Pusan, Shanghai}, {Tianjin,Dalian}). That is to say, from the perspective of international shipping center's infrastructure, Shanghai has been one step ahead Tianjin and Dalian and in the same level with Singapore and Hong Kong. Therefore, the construction of Shanghai International Shipping should focus on the soft environment.

Chapter 4 Target and key problem of Shanghai international shipping center's development

4.1 Strategic target of shanghai international shipping center's development

During the course of my writing the paper, very exciting news was issued by our government that is Shanghai will speed up the construction of two center international financial center and shipping center and until 2020 shanghai international center will reach the world-class level that means it should have the capacity to allocate the shipping resource from all over the world. The target was listed as followed.

(1) Building up world class financial center

The construction of shanghai international shipping center can not be without the support of financial center. The world leading international shipping center such as New York, London, Tokyo, Singapore and Hong Kong are also well-known international financial center. According to the target, Shanghai international financial center will be basically completed until the year of 2020 which should be

in line with our country's economy statue.

(2) Form complete shipping industry service

According to the government target, shanghai will form complete shipping industry service until 2020. High-quality, complete modern shipping service system will provide convenient, efficient and safe shipping environment which can greatly enhance the shipping resource integration capability and improve the competitiveness.

(3) Yang Shan port will build into world class transit port

In accordance with the test-area planning, Yang Shan Port will get a lot of policy support. Compared with other international shipping center, Shanghai transit capacity in Shanghai is not prominent. Shanghai port basically belongs to the hinterland port which greatly limited Shanghai being into international shipping center. There, Shanghai should position itself as an international transit port. December 2005, Yang Shan port was the first bonded area. However, Tianjin, Dalian have successively built up their own bonded area in recent years, hence Shanghai has lost its advantage. According to the target, Shanghai will get more tax policy that can attract more Northeast Asia transit Container.

(4) Cargo distribution and transportation system in water way will reach 60%

According to the target of Shanghai International Shipping Center, Shanghai will further consummate distribution and transportation system. Until 2020, Shanghai will basically complete distribution and transportation system and the system in water way will reach 60%. At present, the distribution and transportation system in rail way and inland river develops very slowly. The expert said water-water multimodal transportation is less than one in a thousand of total throughput and a

large number of land transport caused great traffic congestion which greatly limited the construction of Shanghai international center.

(5) Strive to develop passenger liner industry

According to our government line, Shanghai will strive to develop the passenger liner industry and will issue a series of support policy such as encourage the world leading cruise company to set up sole corporation and give preferential policy to the cruise that always viewed Shanghai as the home port. Meanwhile, in order meet the development of Shanghai cruise industry, Shanghai international passenger center will put into operation.

4.2 The key problems of realizing the objective

4.2.1 The soft environment should be strengthened

Combing the analysis in chapter 3, it can be easily found that the formation of an international shipping center should not only have the basic environment but also the support of the soft environment. From the date above, the infrastructure of Shanghai port has reach the world class. However, compared with other international shipping centers, the soft environment in Shanghai is its weakness. The soft environment lagged behind is very reasonable and normal, because the researching capacity does not like the basic environment construction can be achieved overnight. Shipping services and research capacity largely depends on the good human resources, scientific research environment and market environment that should relatively spend

long time to go through and accumulate. Forming the ability has many complex reasons, but once formed it will not be very easily changed. For instance, the current strength of the United Kingdom in the shipping hardware is not very prominent and it also can be said that Britain has lost world-class port and shipping companies. However, from the perspective of soft environment, the situation is totally different. According to London international financial research report, London has 460 intermediary shipping companies which account for 50% tanker chartering market share, 35% dry cargo chartering market share and 50% vessel purchase and sale market share etc. If it is said that London today is still widely regarded as the most important international shipping center, it is entirely due to its powerful soft environment. According to the example of London, it can be easily concluded that the symbol of the world-class shipping center is its soft environment rather than hard power.

Therefore, on the policy side, Shanghai should implement more open and free policy. Accordingly, bonded area opened in Yang Shan port was a foresight national strategy. This first domestic mode comprised free trade zone, export processing zones and bonded logistic park. Under this existing national policy, this mode is the most open and free trading mode. On the financial side, since Shanghai put forward the strategy "one head, three centers", Shanghai entered a period of rapid growth. Mar 25th, 2009, our government announced in the meeting that Shanghai will basically complete the construction of international financial center and shipping center by 2020.

4.2.2 Financial crisis has brought many problems

In recent years, the construction of Shanghai shipping center makes great progress. Furthermore, the container throughput in the past few years has maintained average annual growth rate more than 20%. However, the financial crisis has greatly influence the development of Shanghai international shipping center. The impact has been listed as followed.

(1) The container throughput fall back after the rise

According to UBS forecast, the Pacific liner was impacted by the United States economy and the volume of container transportation will decline by 3%. Meanwhile, during the period from 2008 to 2009, Asia-Europe line is expected to grow by only 5% to 10% that is greatly less than 20% in the past few years. From the perspective of supply, the export products in Yangtze River Delta region also influenced by the financial crisis, however that is major container supply to Shanghai port.

(2) Shipping company runs at a great loss

With the recent decline in shipping demand, BDI has declined from 1170 to less than 700. Therefore, because the reduction of transportation prices, profitability of shipping company significantly reduced. In addition, a lot of ship owner order great number of vessels that will be delivered in 2010 to 2011. That means the transportation capacity will excess the demand which means shipping enterprises will run large losses in a very long period. Therefore, in order to reduce the operating loss, the shipping companies will greatly adjust the world shipping liner that is not only a challenge but also opportunity. Shanghai should take full advantage of this opportunity to become the international transit port.

(3) More severe port competition

In the short term, the impact of Shanghai port will be greater than China's other ports, because the impact of financial crisis more influence the technology- intensive industry than the labor-intensive industry and Shanghai port is greatly supported by the Yangtze River Delta Area that is place with highest technology in China.

In the long run, risk-resisting ability of Shanghai is much higher than other ports, because Shanghai port has incomparable advantage such as its infrastructure, technology and service etc. In addition, under the pressure of profit and cost, shipping companies will integrate the port of call. That means the ports around Shanghai will be the feeder port to Shanghai.

(4) Shipping service faces the challenge and opportunity

The decline of shipping industry will be bound to negatively impact shipping services sector such as 1) Ship sale and purchase 2) Vessel chartering 3) Ship finance and insurance 4) Logistic service. However, this financial crisis has brought not only a great challenge to Shanghai international shipping service but also accelerated the development.

For example, the banks in United States or European increasingly limit shipping finance however, in China it is relatively relaxed than before. In addition, adding our government support, the shipping finance in Shanghai will face a bright future.

(5) Ship new building industry will enter into winter period

Shipbuilding industry is capital-intensive industry, 80% funds should get from the bank. As the financial crisis had led to a significant tightening of international banks, the total global amount of ship finance has been reduced to 100 billion U.S. dollars

in 2008. In addition, ship new building sharply drops and the orders revocation rates increase greatly.

Chapter 5 Summary and suggestion to the construction and development of Shanghai international shipping center

5.1 Summary

After calculation and analysis in the chapter 3 and chapter 4, the conclusion can be got as followed.

By using Principal component analysis and Cluster analysis to position the international shipping center, the results as followed: The selected seven existing international shipping center in East Asia Singapore, Hong Kong, Busan, Kaohsiung, Shanghai, Dalian and Tianjin can be divided into four categories. The First category: Singapore and Hong Kong; the second category: Shanghai; the third category: Kaohsiung and Busan; fourth category: Dalian and Tianjin. It can be easily seen that Shanghai international shipping center belongs to the second level slightly lower than the first level Hong kong and Singapore. Therefore, Shanghai has great potential to develop into first-class international shipping center.

The research on the seven existing shipping center's basic environment and get the

results as followed: This seven international shipping center can be divided into two categories First Class: Singapore, Hong Kong, Shanghai, Kaohsiung and Busan; the second category: Dalian and Tianjin. This shows that Shanghai currently has basically reached the requirements of an international shipping center and the next step should focus on the construction of soft environment. However, during the course of Shanghai international shipping center's construction, the financial crisis has influenced the development a lot and brought many new problems. On the other hand, this financial crisis has brought more opportunities than challenges. Therefore, according to the analysis and our target above, the suggestions are listed as followed.

5.2 Suggestion

5.2.1 Improve the legal, policy environment for the implementation of a free port policy

The developed shipping industry countries and regions have set a series of policies and regulations to protect and promote the development of shipping industry. Accordingly, in the course of International Shipping Center's construction and development, Shanghai

Should learn the experience from oversea and set a series of policies and regulations that should be not only suitable for the actual situation but also in line with international standards.

The construction of Yangshan Deep-water Port is a great strategic decision-making

made by our government and it built a solid foundation for a container hub port. On the other side, it is very necessary to reform our notions and regulations in order to ensure Shanghai to build into international shipping center as soon as possible. Therefore, the implementation of a free port policy is the most effective measure which has been generally adopted by most famous international shipping center. In the world's leading container port, Hong Kong and Singapore are the most free City, Rotterdam self-proclaimed "more than free port" and Hamburg is also the most typical free port in Europe. Accordingly, the establishment of a free port is the key to build Shanghai into container hub port in Northeast Asia.

5.2.2 Improve the shipping market system, and regulate shipping market environment

The world famous international shipping center such as London, New York, Hong Kong and Singapore all have very complete market system. This system includes a variety of traditional basic shipping industries such as port and shipping company etc.

Around these traditional basic industries, it also has formed a number of related industries and relevant market such as shipping market, chartering market, shipbuilding market, marine insurance markets and financial markets etc. Accordingly, in order to build into international shipping center, Shanghai should not only construct and develop basic shipping industries but also must fully develop modern shipping service industry and gradually improve the Shanghai international shipping

center’s shipping market system.

5.2.3 Speed up the construction of international financial center

Well-developed financial sector provide a convenient and powerful support for the rapid development of the shipping industry. Currently, Shanghai's financial industry is in the first level in the nation. Shanghai took the lead to carry out a series of reform initiatives such as conduct RMB business in the foreign-funded banks, reform financial products, open insurance market etc. The first nine foreign bank approved by China Banking Regulatory Commission all choose Shanghai as their Chinese headquarter. It can be clearly seen that
Shanghai is very important in competitive strategy and on the other hand, indicates that this openness provide a new opportunity to the construction of Shanghai international financial center.

However, compared with other famous international financial, Shanghai has a great way to go:
(1) Credit environment and intermediary services are not very good. Although the credit system and legal awareness in Shanghai is in the leading level in our country, gap is still large when compared with international standard.

(2) Financial market lacks the depth and breadth and the level and structure is not very reasonable. At present, many capital markets develop not very quickly in Shanghai except stock market. However, securities markets should run high transaction costs and very risky system. As a result, direct financing and indirect financing is imbalanced which lead our bank to run huge risk.

(3) At present, our domestic financial institutions is far from international financial institutions, therefore they do not have the enough ability to participate in international competition. Meanwhile, in the aspect of our financial service, financial innovation and financial information, there is still a long way to go.

(4) Finance, trade and shipping industry are not well supported with each other. Therefore, Shanghai should learn from London and New York and make the finance industry actively participate in the construction of an international shipping center. The shipping industry is a capital-intensive industries, good development of financial sector will further expand the financing channels for the shipping industry to solve shortage of funds. Therefore, the improvement the financing environment will be conducive to capital market development and provide adequate capital for shipping industry. The financial industry also can play a very important role in shipping and trade clearing.

5.2.4 Speed up the construction of shipping information center

With the several years' development, Shanghai communication infrastructure has reached a certain achievement. The opening of Shanghai information center facilitates the exchange of information home and abroad. In 1995, Shanghai EDI transmission platform was opened which provide service for government, port, shipping companies, container yard, logistic companies and etc. However, Shanghai Shipping Information Center is still in the initial stage: the amount and quality of shipping information is still lagging behind the international level, information channels are not enough, private information agencies are not enough, information services will need to be further improved. Therefore, Shanghai should speed up the construction of Information Center, encourage the establishment of public and

private information institutions and develop consulting industry.

5.2.5 Promote Shanghai Shipping Exchange information technology

From the experience of international shipping center London and New York, it can be easily found that owing a world-class Shipping Exchange is a strong support to solid international center's position. View the history of shipping center, though London and New York's throughput does not have obvious advantage, they always be recognized as a global international shipping center because they have world-class shipping exchange which plays a very important role in the world shipping market.

At present, Shanghai shipping exchange has completed the construction of information centers which made enough preparation for Forward Freight Agreement. But currently Shanghai shipping Exchange is not well-known compared with Baltic Shipping Exchange. Therefore, in order to complete the construction of Shanghai international shipping center as soon as possible, Shanghai Shipping Exchange should pay more effort on information technology, for doing so it can effectively provide more valuable shipping information.

5.2.6 Increase the investment of human resources and improve the quality of talents

Nowadays, the focus of economic competition has shift from material resources into human resources. At present, Shanghai shipping center's talent has grown into stable growth stage which can generally suit for the development of Shanghai shipping industry.

However, in accordance with the construction of Shanghai international shipping center requirements, the status of human resources has several questions as followed:

(1) Talent distribution is very uneven.

The shipping human resource in Shanghai is very unbalance, the proportion of shipping management and legal talent is too low.

(2) The overall quality of personnel is not very high

1) Lack of compound talents. 2) Slowly update professional knowledge 3) Lack of new shipping concept and notion

(3) Senior shipping talent is ageing

Although Shanghai shipping talent's structure is basically reasonable, the senior shipping talent is old.

Therefore, Shanghai should take full advantage of the domestic human resources to build up senior shipping talent. In addition, it should learn from Singapore to strengthen shipping education and like Hong Kong to bring international shipping talent.

Chapter 6 Conclusion

This thesis mainly talks about the position of Shanghai international shipping center in the world after ten years' development and construction. In the first part, the paper

mainly introduces the generality of international shipping center from the perspective of concept, development process and trend. The second part is the study about the comparison between Shanghai and other famous international shipping centers. In this part, the most important thing is to form evaluation indicator system to international shipping center. Meanwhile, the principal compenent and cluster analysis was used to get the position of Shanghai international shipping center in the world. From this analysis, it can be easily found that the basic environment of Shanghai shipping center has reach the woorld class, however the soft environment is its weakness. Thirdly, it mainly conclude our government guide line issued in 25 March 2009 which said Shanghai should speed up the constrution of two center and some main target. In this part, it also mention the problems brought by financial crisis. Finally, according to the analysis, government target and the problems brought by the financial crisis, some suggestions was put forward.

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