

A Study on Port Alliance between Incheon Port and Major Ports in Northern China

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Abstract : *Recently, amount of cargoes from main ports in Northeast Asia have rapidly increased and as well surplus port development in same region corresponded with the boom in external trade that resulted from successful export-oriented economics strategy by China, Japan and South Korea. To cope with this business circumstances, a certain form of port alliance is desperately needed to provide a suitable service to customer and establish their countervailing power against the shipping alliance.*

Nevertheless, Incheon seaport has not made a definite port alliance system with main ports in Northern China yet. Thus, the purpose of this study is to identify the key success factors to form a port alliance through examining previous studies. We have benchmarked previous studies which are related to main ports in global region and the questionnaire on customers of ports. By studying this, we are able to suggest a few strategies for forming successful port alliance to enhance Incheon port's capabilities in the long term plan. As a policy proposal, this study suggests Incheon port and main ports in Northern China should construct a logistics infrastructure through mutual investment and provide an incentive system when the ocean carrier makes port call to both ports.

Key words : *Incheon seaport, Port alliance, Competition, Northern china, Calling port*

1. Introduction

Port competition among the countries is getting fiercer due to the competitive development of the main ports in China, Korea and Japan(Wang and Slack, 2004¹⁾). Port competition that once started in Europe is now at its peak in East Asia(Ircha, 2001²⁾).

However, the port competition in some region could generate excessive investment as a results of surplus facilities, which means ports could certainly lead to financial problems.

The motivation of this study is that the strategies for forming alliance among ports could be useful to container ports. Particularly, ports in Northern China and Incheon port who are geographically located near each other and have considerable amount of transport cargoes between mutual ports are the case for this study.

Nonetheless, the case of South Korea, there is no close port cooperation with Northern China. Especially, the case of Incheon port which is located in a favorable geographical position on the route of trade with Northern China and the main port in Northeast Asia, there is no port alliance strategy, even though there is shipping service.

Therefore, the purpose of this study is to carry out a Win-Win strategy to push ahead with the port alliance

between Incheon port and the main ports in Northern China.

2. Scope of Study

2.1 Outline of port alliance

1) Concept

It is very difficult to survive a business in the global competition. Especially if there is only a hostile competition policy from the perspective of the market environment changing by enlargement of global production network.

Active cooperation with related companies has been appeared in the various market circumstances for surviving in business.

In the same stream, there has been considerable number of global alliances in the shipping industry. Shipping companies have tried to preoccupy their competitive position through forming shipping alliance such as New World Alliance, Grand Alliance, CKYH Group and so on.

In general, port operators who mainly focus on expanding their position through merging, collusion and cooperation with others, are fighting against shipping alliances. Especially, the global top 10 port operators, such as P&O Ports, Hutchinson Port Holdings and PSA(Port of Singapore Authority) have consistently expanded their

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1) Wang, J. J. and Slack, B. (2004). "Regional Governance of port Development in China: a case study of Shanghai International Shipping Center" Maritime Policy and Management, Vol.31, no.45; pp.357-373

2) Ircha, M.C.(2001), "Port Strategic Planning :Canadian port reform", Maritime Policy and Management, Vol.28, No.2, pp.1257-140

market share through M&A, joint venture, and port development(Heaver et al, 2001).

Port alliance strategy generally suggests mutual cooperation between ports considering regional conditions to get a superior position to respond to shipping alliance.

In other words, port alliance strategy would expect more various collaboration between ports to achieve the Win-Win effect.

2.2 Necessity

As mentioned above, necessity of port alliance would be accepted in that it can save the overall cost through cooperation with other ports and share the investment risk in terminal and equipments development. Therefore, it will enable ports to upgrade the quality of customer service effectively through sharing resources.

2.3 Motivations in application of port alliance

The motivations of port alliance can be divided into five sectors; strategy, finance, economy, operation, and marketing(Song, 2002).

However, this chapter covers four sectors since the financial and economic motivations are considered from the same perspective.

1) Strategic motivation

Mutual cooperation between ports to get the superior position to respond to shipping alliances.

2) Financial and economic motivation

Necessary to lower the cost effectively through sharing expenses in marketing and port investment; avoiding oversupply by excessive investment.

3) Managerial motivation

Necessary to maximize management efficiency by sharing techniques and resources through exchanging technology and know-how information.

4) Marketing motivation

Planning collaborative marketing strategy to respond customers who want to be served with higher quality and customized services.

3. Review of Literatures

Juhel(2000) proposed the importance of partnership among ports and the roles of port authorities. Its main roles as a public sector are to activate transport system, make

impartial competition environment to provide a various port service, define adjustable roles between public sector and private sector, and prepare port marketing.

Song(2004) explained the Win-Win game strategy among ports by introducing the concept of port co-opetition, which can be classified into strategic, financial, economical, operational, and marketing approach.

T. Heaver and E. Van de Voorde(2001) suggested strategic policy focusing on competition and cooperation among entities in container terminal.

Notteboom and Winkelmans(2001) addressed that one of the pivotal roles of port authority made co-opetition strategy with nearby ports to respond rapid environmental change of port and shipping industries.

Table 1 Summary of literature review

	Objects	Methodology	Main Issue
Juhel(2000)	Shippers, Entities of Port	Interview analysis	· Partnership of Ports · Roles of Port Authorities
Song(2004)	Domestics Port	Content Analysis	· Main Factors of Co-petition -Strategic, Financial, Economical, Operational, and marketing motives
T.HEAVER (2001)	Entities of Port	Theoretical Analysis	· Competition and Cooperation among Entities in Container Terminal.
Notteboom (2001)	Entities of Port	Theoretical Analysis	· Co-opetition Strategy with Short and Long Distance Ports

4. Definition of Port Alliance Type and Target Port Selection

4.1 Definition of port alliance type

This chapter proposes two types of port alliance in which the one type of alliance of inter-ports situated adjacent distance where ports shares same hinterland. The other type is situated long distance each other and has own hinterland.

An alliance of inter-ports situated adjacent distance means inter-ports that are sharing same hinterland compete and cooperate to attract cargoes. It is possible to operate this type of alliance not only inter-ports cooperation within same countries but also nearby inter-ports in different countries.

In addition, the inter-ports would jointly compete and cooperate to attract cargoes, develop port facilities as investing mutual funds and activate joint port marketing to cover the shared hinterland.

Shenzen port and Hongkong port in China cooperate along with port of Copenhagen, Denmark and Malmo.

Sweden could be considered as a good example of alliance of inter-ports situated adjacent distance. With similar reasons, alliance of inter-ports situated long distance means inter-ports have their own hinterland, meantime they are competing and cooperating with common purpose-attracting cargoes and mutually developing port facilities.

The alliance of Kitakyushu port and Tianjin port, which have attracted enterprises and related logistics activities into their own hinterlands jointly and provided additional shipping service for both ports once a week, along with a port alliance of Shanghai and Hamburg on purpose to enlarge port throughput between Europe and China, could be regarded as a good example of alliance of inter-ports situated long distance.

Table 2 Origin/Destination of shipping export/import cargoes between Incheon and China

No.	Export (Ton)		Import (Ton)		Total (Ton)
1	Huangpu	427,742	<i>Dalian</i>	<i>5,335,944</i>	<i>5,763,686</i>
2	Shanghai	426,657	Tianjinxingang	4,674,778	5,101,435
3	Qingdao	<i>271,013</i>	<i>Qingdao</i>	<i>4,635,599</i>	<i>4,906,612</i>
4	Tianjinxingang	252,477	<i>Qinhuangdao</i>	<i>4,167,898</i>	<i>4,420,375</i>
5	Weihai	<i>218,399</i>	Shanghai	2,884,059	3,102,458
6	Yantai	<i>145,880</i>	Rizhao	2,238,757	2,384,637
7	Tianjin	<i>135,196</i>	BAYUQUAN	2,020,122	2,155,318
8	Dalian	<i>108,860</i>	<i>Lianyungang</i>	<i>1,720,360</i>	<i>1,829,220</i>
9	Ningbo	<i>100,460</i>	Huangpu	1,542,263	1,642,723
10	Shidao	70,356	<i>Tianjin</i>	<i>1,492,626</i>	<i>1,562,982</i>
11	Lianyungang	<i>68,420</i>	Jinzhou	1,390,445	1,458,865
12	Zhangjiagang	55,582	Zhangjiagang	880,539	936,121
13	Yantian	<i>44,176</i>	<i>Dandong</i>	<i>795,888</i>	<i>840,064</i>
14	DINGBO	35,460	<i>Yantai</i>	<i>727,995</i>	<i>763,455</i>
15	Dandong	<i>35,098</i>	Nanjing	727,372	762,470
16	Nanjing	21,375	Xiamen	594,279	615,654
17	Haimen	20,820	<i>Weihai</i>	<i>590,511</i>	<i>611,331</i>
18	Nantong	19,872	Nantong	528,834	548,706
19	Changchun	13,696	Lanshan	463,108	476,804
20	Yingkou	<i>12,438</i>	Jinghong	452,781	465,219
21	Zhenjiang	12,059	<i>Yingkou</i>	<i>444,821</i>	<i>456,880</i>
22	Qinhuangdao	<i>9,934</i>	Ningbo	438,595	448,529
23	Lanshan	9,724	Fangcheng	417,341	427,065
24	Guangzhou	7,084	Changchun	373,855	380,939
25	Xiamen	6,985	Liuzhou	365,609	372,594
26	Wuhu	6,962	Longkou	355,988	362,950
27	Zhuhai	6,205	Zhenjiang	335,049	341,254
28	Huizhou	5,780	Fuzhou	330,792	336,572
29	Taicang	5,589	Dongshan	329,707	335,296
30	BAYUQUAN	4,442	Tongling	160,674	165,116

This paper proposes the policy on alliance of inter-ports situated long distance excluding alliance of inter-ports situated adjacent distance.

4.2 Target port selection

According to the alliance of inter-ports situated long distance, selection criteria for target port is split into two points: firstly, quantity of export/import cargoes between Incheon and China and secondly, ports located in North China region, many of whom have superior approximation geographically with Incheon port.

It is for this reason that target ports are selected with Qingdao, Dalian and Tianjin as major ports and Weihai, Yantai, Dandong, Qinhuangdao, Yingkou, and Lianyungang as minor ports.

5. Case Study

This chapter shows one type which is the alliance of inter-ports situated long distance each other with their own hinterland.

Inter-ports alliance would jointly compete and cooperate to attract cargoes, develop each port facilities as investing mutual funds and activate joint port marketing to promote their own hinterland.

5.1 Kitakyushu-Tianjin

Port of Kitakyushu, Japan and port of Tianjin, China signed the agreement to activate passenger transportation and logistics performance on November 2005. This agreement is called "Partner port".

It includes the extension of shipping and aviation lines, collaboration for promotion activities, introduction of incentive, support of related logistics enterprise, information exchange and cooperation research and construction of human network between both cities. In addition to above cooperation, it made a concrete collaboration such as 12 feet container transportation and simplification of the customs process between both countries.

5.2 Portland-Atlantic Canada³⁾

Ports in Atlantic Canada and New England began collaboration with each other for both cargoes and cruise businesses in the region from June 13, 2005.

In other words, Canadian and New England ports are focused on working together to bring more cargoes and

3) Canadian Sailings, 2005. 6. 13. p.11

those who sail on cruise ships to their front door.

5.3 Shanghai-Hambrug⁴⁾

The agreement was made against the background of the importance of Shanghai-Hambrug seaports. Each port has a respective market region and potential growth in foreign trade by sea connected China to Europe.

The port partnership aims to further development of goods traffic between China and Europe via the ports of Shanghai and Hamburg. It is of particular interests to both partners to strengthen their cooperation in the area of port planning, port administration, port construction and information technology.

5.4 Tauranga-Brisban

Port of Tauranga, New Zealland and Brisban, Australia have made an agreement to extension of network to enhance competitiveness of both ports since October 10, 2000.

This agreement contains the context of sharing port technology, marketing, trade information and expertise between both ports as a part of port integration.

5.5 Taicang-Busan-Gwangyang⁵⁾

Busan port and Taicang port opened new shipping feeder service via route of Busan-Gwangyang-Taicang scheduled with once a week from September 2006.

This service has a very significant implication in that Busan port attracts container cargoes around Yangtzu river which was used to be transshipped cargoes to Shanghai port in the past. It is being considered as a performance of the first alliance between main ports in Korea and China.

5.6 Port of Singapore(PSA)-Port of Tanjong Pelepas(PTP)

Temasek, the government investment organization of singapore and PTP(Port of Tanjong Pelepas), operator of Malaysia, have had number of meeting to discuss cooperative policy between two ports since October 2006.

Both ports have been in serious competition to get exclusive position as a hub of transshipment in Southeast Asia.

Generally, port alliance focus on not only generating cargoes through construction of network but also

collaboration agreement to share port technology, marketing and trade information.

6. Empirical Analysis

6.1 Questionnaire summary

From the perspective of enlargement of port alliance, this research develops the questionnaire based on deep interview with expert groups those whom are from shipping companies, terminal operating companies and freight forwarders.

It was conducted from time period of 1st July 2007 to 15th July 2007(15days) and total 41 of shippers, forwarders and terminal operating companies contributed by answering questionnaire. Among them, the contribution portions are consisted of 15 from shippers, 20 from forwarders and 6 from terminal operating companies.

Process of empirical analysis is as followed : firstly, it finds a strategic motivation. Secondly, it sets the priority of cooperative contents at current and prospect status and lastly, ensures success factors in port alliance.

Table 3 The collection results of questionnaire

	Nos. of Questionnaire sent to customers	Respondent	Ratio(%)
Shipping companies	18	15	36.59
Terminal operating companies	9	6	14.63
Freight forwarders	37	20	48.78
Total	64	41	100.00

The results of questionnaire are applied to the 'frequency analysis' and IPA(importance-performance analysis)⁶⁾ by using SPSS.10.0 version.

The application of IPA introduced by martilla and james(1977) is well documented and has shown the capability to provide service managers with valuable information for both satisfaction measurement and the efficient allocation of resource, all in an easily applicable format.

4) The Journal of Commerce, 2004. 9. 13.p.42

5) <http://www.busanilbo.com/>

6) IPA: Importance Performance Analysis is very useful method with respect to distinguishing prior advancing factors and surplus investment factors, as one of the statistics tools which are expressed by satisfaction index and importance index on the XY axis, the second dimensional coordinates.

6.2 Results

1) Strategic motivation of port alliance

An importance level of motivations of port alliance and its detail attributes are identified in this chapter. The importance level can be described a highest level with 'very important' and lowest level with 'not importance at all'. After this, total importance level is figured out considering its detail attributes with out of 100 point.

"Existing customer management"(75.2) and "Attraction of new customers"(74.0) in marketing motivation are recorded with significantly good point since it is an important attribute. "Excessive supply and competition"(65.6) in financial/economic motivation is sequentially followed.

Table 4 Importance level of motivations of port alliance

Contents		Total Importance Point
Strategic motivation	Mutual Cooperation, Joint Venture, Strategic Alliance	62.5
	Integration of Terminal Cooperative Management	63.4
Financial/Economic Motivation	Excessive Supply and Competition	65.6
	Secure Operation and Management by Joint Venture	61.9
Operational Motivation	Technology and Know-How Exchange	54.9
	Sharing Facilities	56.0
Marketing Motivation	Attraction of New Customers	74.0
	Existing Customer Management	75.2

Note : A full marks is 100 point

Song, D. W.(2004), Park, C. H.(2006), and Ko, Y. G.(2003) proposed the above following factors as a level of motivation of port alliance and the author decreased to four factors from five factors based on the previous studies, integrating financial and Economic motivation.

2) Main cooperative contents of port alliance

To success the current port alliance between Incheon and Northern China ports, the most important cooperative contents are appeared with "exploitation of shipping lines" and "information exchange".

On the other hand, for the potential port alliance, the

most important cooperative contents are identified with "partnership" which is ranked as first for Incheon/Qingdao, Incheon/Dalian and Incheon/Tianjin. Furthermore, "mutual service development" and "cooperation" both are ranked on top of Incheon/Weihai-Yantai, Incheon/Dandong-Qinhuangdao-Yingkou.

An implication derived from the above discussion suggests that alliance policy of Incheon port is required to focus on "partnership" in the current status and "mutual service development" and "cooperation" in the prospect status.

Table 5 Main cooperative contents of port alliance

No.	Contents	Incheon /Qingdao	Incheon /Dalian	Incheon /Tianjin	Incheon/ Weihai-Yantai	Incheon/ Dandong-Qinhuangdao-Yingkou
1	Exploitation of Shipping Lines	10(14)	6(14)	6(13)	7(8)	5(10)
2	Information Exchange	9(14)	4(6)	6(5)	7(9)	6(8)
3	Mutual Service Development and Co-operation	5(13)	3(9)	2(12)	6(13)	1(13)
4	Partnership	8(17)	5(16)	2(15)	5(12)	4(12)

Note : Numbers in table mean the frequency by respondents in the current status and numbers in a parenthesis mean the frequency in the prospect status.

Song, D. W.(2004), Park, C. H.(2006), and Ko, Y. G. (2003) proposed the above following factors as main cooperate contents of motivation of port alliance.

3) Target ports⁷⁾ of port alliance

To catch the target ports for forming port alliance, the priority of target ports was ranked from the first to the third by respondents; the results shows that Incheon/Qingdao, Incheon/Dalian, Incheon/Tianjin, Incheon/Weihai-Yantai and Incheon/Dandong-Qinhuangdao-Yingkou in order. The result is correspondent with common opinion which means Incheon port is required to give priority weight more on major port than minor port in Northern China to build effective alliance.

7) Ports in Northern china selected to be alliance ports with Incheon port

Table 6 Priority of target ports

Target ports	Total Ranks		
	1st	2nd	3rd
Incheon /Qingdao	25	11	2
Incheon /Dalian	12	18	8
Incheon /Tianjin	11	16	11
Incheon/Weihai-Yanta	10	15	13
Incheon/Dandong-Qinhuangdao-Yingkou	3	7	28

Note : Numbers in table mean the frequency by respondents

4) Successful attributes of port alliance

① IPA analysis

The most valid method of performing and validating IPA are identified in this chapter. Importance-Performance Analysis (IPA) has been a popular tool for understanding customer satisfaction and prioritizing service quality improvements since Martilla and James (1977) firstly demonstrated this simple technique over 25 years ago.

In a typical IPA, average customer ratings of Importance-Performance(IP) across several attributes are plotted against each other and the result of Importance-Performance (IP) space is divided into four quadrant.

By examining the points in each space of quadrant, a port manager may infer which attributes' customers should be the highest priority for improvement and the lowest priority for improvement. The port manager can then consider the costs of various improvements and develop an action plan. Thus, IPA provides them a simple graphical representation of estimated customers' satisfaction level on port service; in detail, it gives some directions of improvement for port, and an indication of particular improvement providing reason of customers' needs.

Several approaches in this chapter have been used to undertake Importance-Performance Analysis (IPA), regarding the priorities for improvement or costs of various improvements. This can be compared with successful factors of port alliance between Incheon and target ports in Northern China, and found out the priorities and methods for various improvement.

② Successful attributes analysis for ports alliance

Fig. 1 and Fig. 2 shows a successful attribute matrix for port alliance, dividing importance index and satisfaction index respectively.

③ Incheon/Qingdao · Dalian · Tianjin

The results derived from IPA are illustrated with X(horizontal axis)-satisfaction index, Y(vertical axis)-importance index. There are an average point of (X, Y)-(2.38, 3.57).

The attributes on maintenance management space, the first space of quadrant means that this importance index and satisfaction index are higher than average values. The attributes indicate "reduction of port tariff", "enlargement of service frequency" and "port technology and know-how exchange".

The attributes on pivotal improvement space, the second space of quadrant means that the importance index is higher than average value while satisfaction index is lower than average value. The attributes are "mutual investment for terminal" and "joint venture for cooperation".

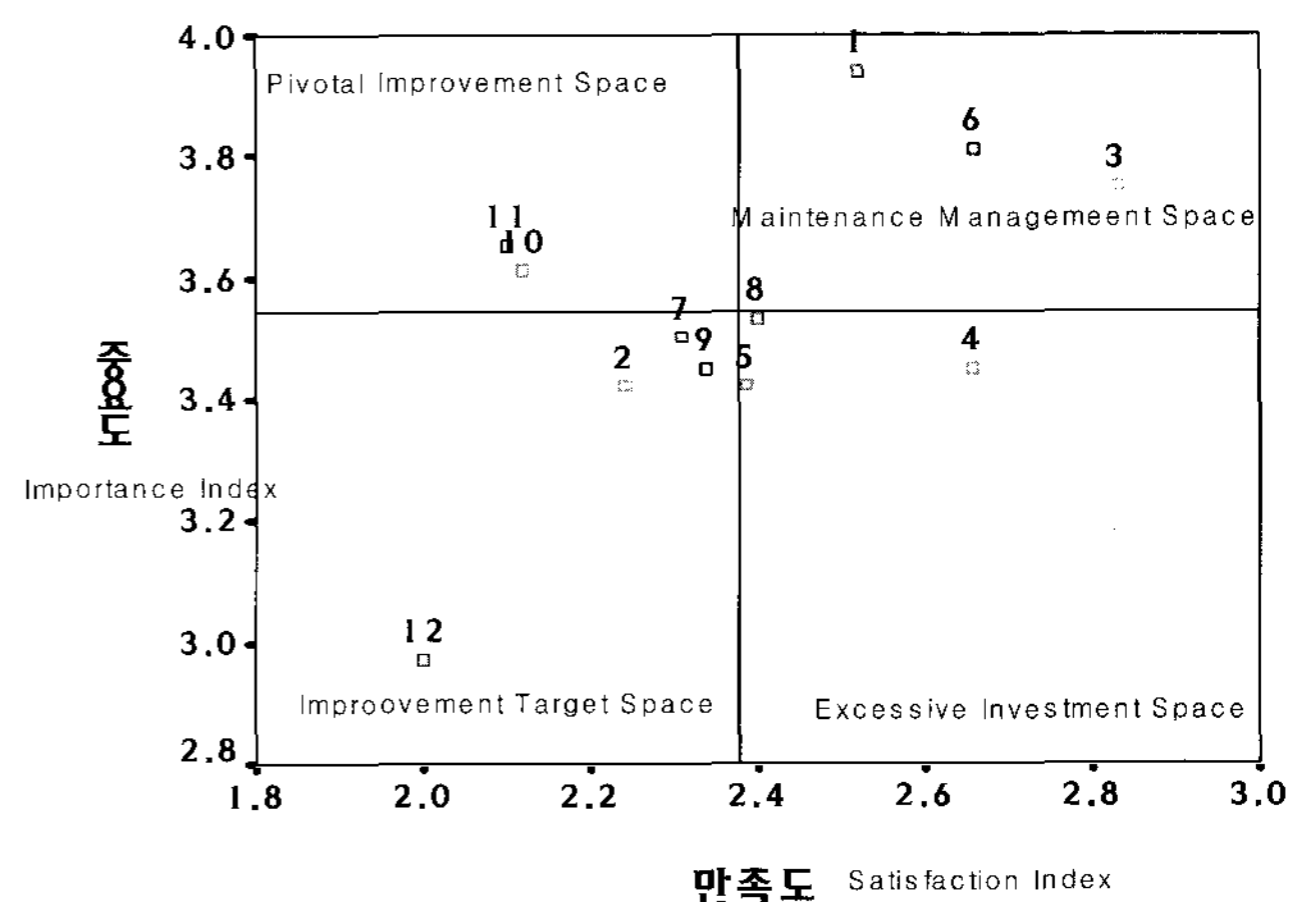


Fig. 1 Importance-satisfaction matrix for port alliance between Incheon and Qingdao · Dalian · Tianjin

Table 7 Importance-Satisfaction analysis for port alliance between Incheon and Qingdao · Dalian · Tianjin

Pivotal Improvement Space	Maintenance Management Space
<ul style="list-style-type: none"> · Mutual Investment for Terminal · Joint Venture for Cooperation 	<ul style="list-style-type: none"> · Reduction of Port Tariff · Enlargement of Service Frequency · Port Technology and Know-How Exchange
Improvement Target Space	Excessive Investment Space
<ul style="list-style-type: none"> · A Subsidy for New Service Lines · Incentive Support for Joint Calling · Sharing of Terminal Equipments · Joint Education and Transition of Port Technology 	<ul style="list-style-type: none"> · Establishment of Sisterhood Relationship Port and City · Joint Promotion and Marketing Activities · Personal Exchange

④ Incheon/Weihai · Yantai · Dandong · Qinhuangdao · Yingkou

The results derived by IPA are illustrated with X (horizontal axis) representing satisfaction index and Y(vertical axis) representing importance index. The average value of (X, Y) pair is (2.45, 3.42).

For the attributes on maintenance management space, the first space of quadrant means that importance index and satisfaction index are higher than average values. The attributes are listed with "reduction of port tariff", "enlargement of service frequency" and "joint promotion and marketing activities".

For the attribute on pivotal improvement space, the second space of quadrant means that the importance index is higher than average value, while the satisfaction index is lower than average value. The attribute here is "incentive support for joint calling".

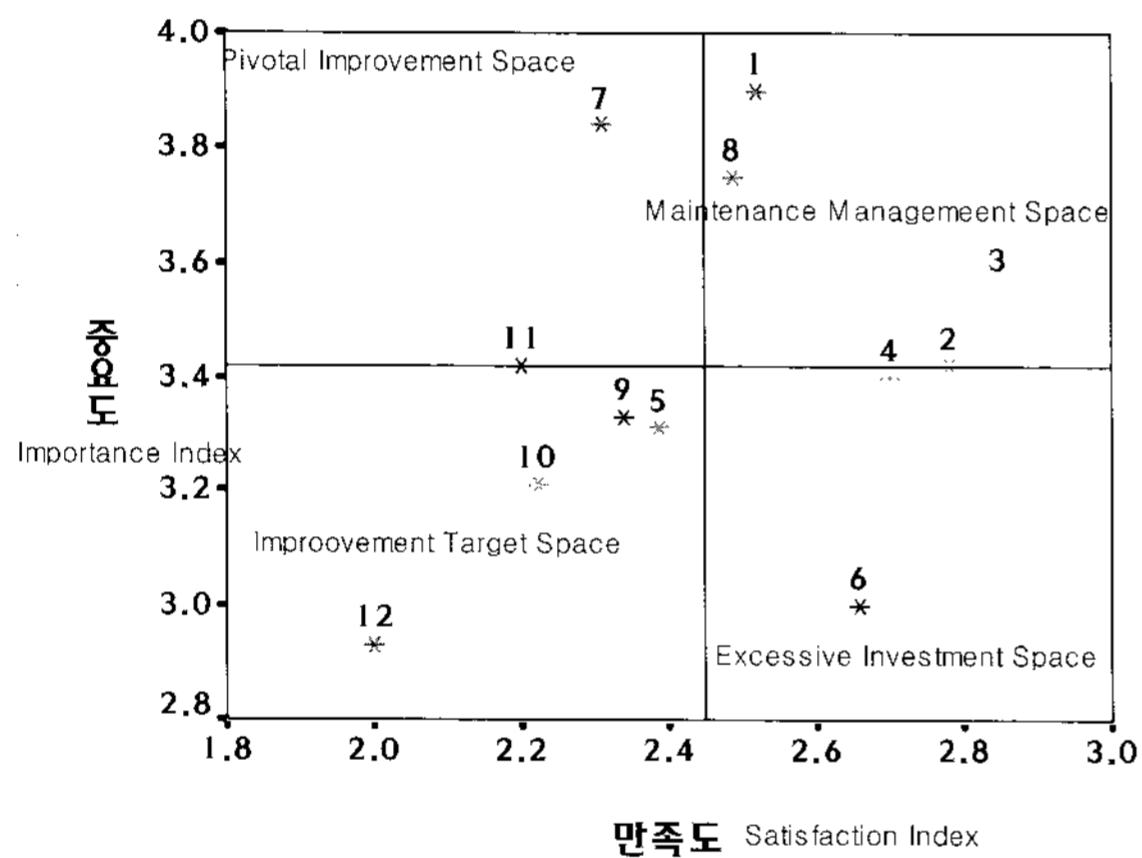


Fig. 2 Importance-Satisfaction matrix for port alliance between Incheon and Weihai · Yantai · Dandong · Qinhuangdao · Yingkou

Table 8 Importance-Satisfaction analysis for port alliance between Incheon and Weihai · Yantai · Dandong · Qinhuangdao · Yingkou.

Pivotal Improvement Space	Maintenance Management Space
· Incentive Support for Joint Calling	· Reduction of port tariff · Enlargement of service frequency · Joint promotion and marketing activities
Improvement Target Space	Excessive Investment Space
· Personal Exchange · Joint Venture for Cooperation · Sharing of Terminal Equipments · Joint Education and Transition of Port Technology	· Port Technology and Know-How Exchange

7. Strategic Policy for Port Alliance

7.1 Process

Rapid organizing of port alliance between Incheon port and Northern China ports would be the most significant strategy being considered by following three steps.

For the first step, it is required to be connected to various route of container, feeder and car-ferry to generate real throughput⁸⁾ and engaged to generating trade cargoes between Incheon port and China ports.

In the second step, the joint investment about mutual port and hinterland through enlargement of port equipments and exchange of information could be proposed since it is regarded to bring a growth of trade cargoes, reduction of investment cost and construction of global logistics network in Northern China region.

In fact, "pushing ahead port alliance with both ports" may not result effective cargo generation. Therefore, in the third step, it is needed to attract mutual enterprises into hinterlands of both port to create cargo demands that could contribute high value-added business for regional port. It could raise the competitiveness among enterprises, and activate the regional economy.

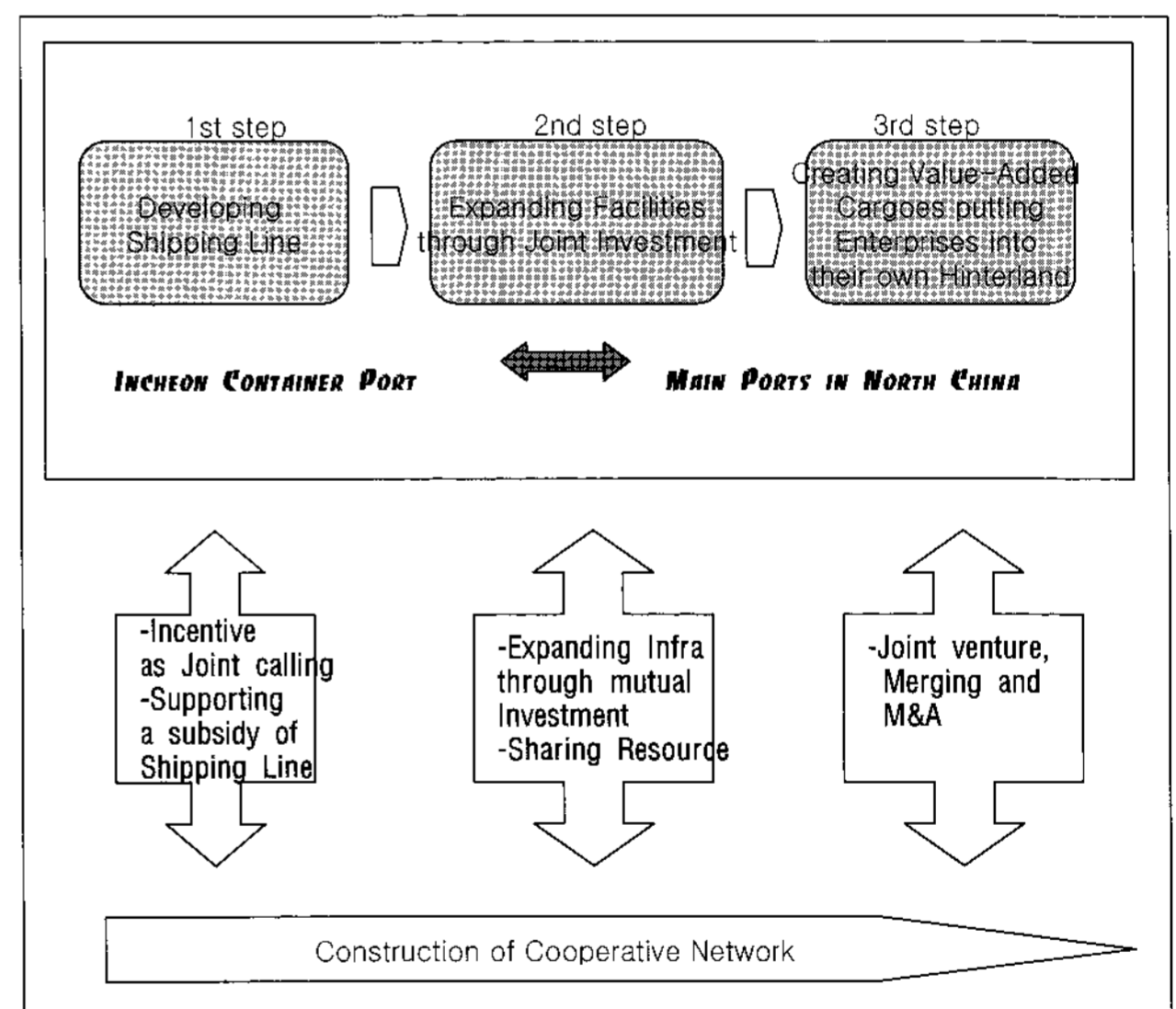


Fig. 3 Port alliance process

7.2 Policy proposal

To bring an alliance of inter-ports situated long distance with Northern China to a successful issue, Incheon port is firstly recommended to proceed "joint venture for cooperation"

8) Heung-a shipping and STX Panocean opened new service lines on may, 2006, calling Incheon- Qingdao-HongKong- Raem chabang-Hochiminh with 3 vessels of 800TEU ships per weeks. Hanjin shipping and Heung-a shipping additionally included tianjin, shanghai, Qingdao ports on the KJX(Korea Jakarta Express) service in the early of 2007, creating weekly regular service at Incheon port.

and "sharing terminal equipments with Qingdao · Dalian · Tianjin", and secondly "incentive support for joint calling" and "joint promotion and marketing activities with Weihai · Yantai · Dandong · Qinhuangdao · Yingkou".

For this, central government, port authority, shipping companies and domestic enterprises should throughly and systematically need to research on logistics market information of strategic road center in China.

In this study, it is suggested that Incheon city and IPA need to dispatch their staffs on condition of long-term contract to not only collect information of logistics market but also recognize inconvenient factors of enterprises related. Furthermore, central government and municipality should positively perform and fully support in consultation with shipping companies and the companies that are doing business through port.

In addition, central government and municipality should ensure the port tariff reduction and various incentive system that are attractive enough to shipping companies calling at alliance ports.

Lastly, construction of port information system between alliance ports may help "joint promotion" and "marketing activities" providing swift service with shipping companies and shippers.

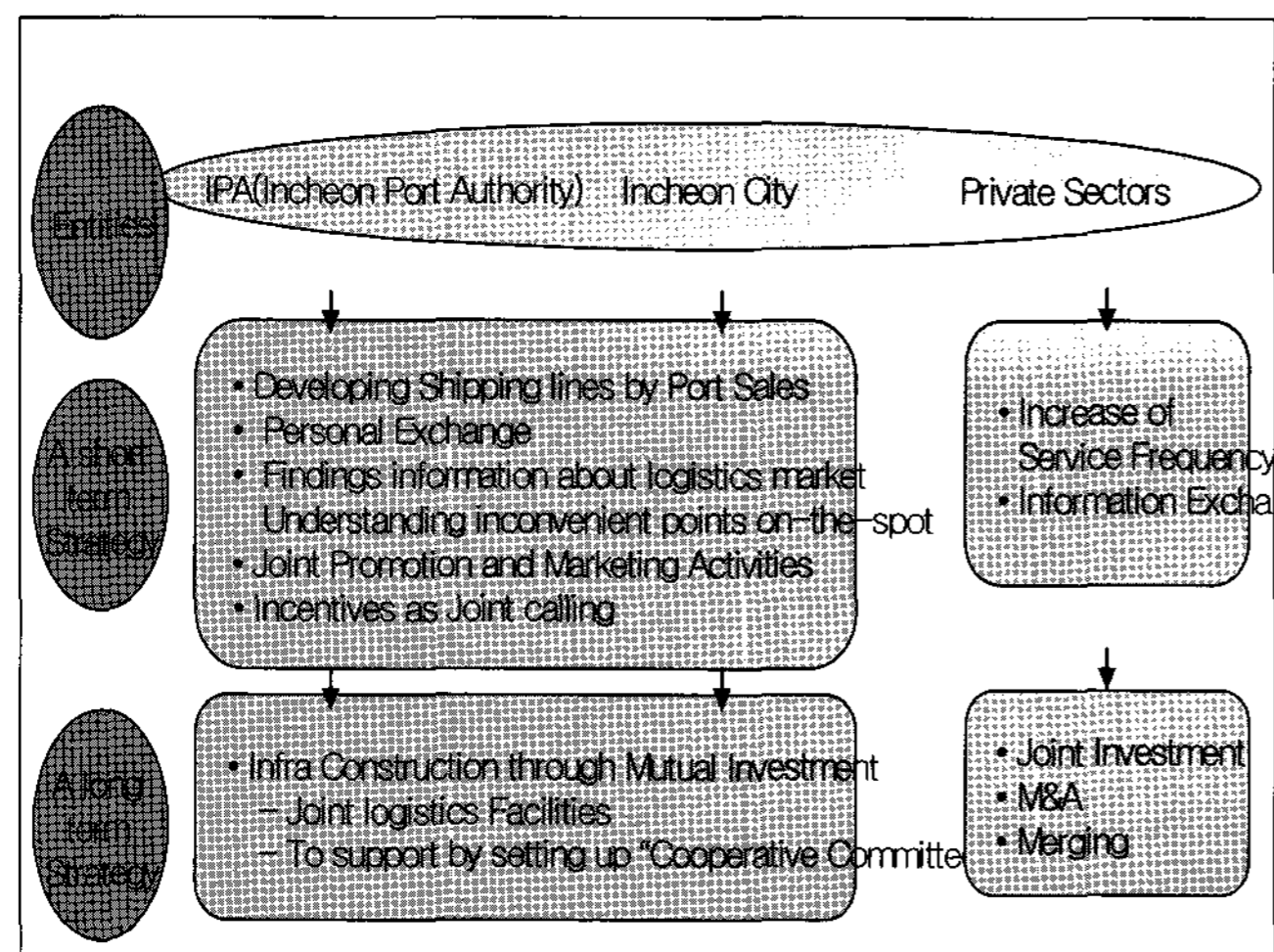


Fig. 4 Port Alliance Policy

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