

# World Logistics Evolution & Marketing Strategy for Korea's Enhanced Port Competition\*

세계물류발전과 한국의 항만경쟁력 강화를 위한 마케팅 전략

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Key Words: World logistics, port logistics, hierarchical fuzzy process, integral approach, berth productivity

## Abstract

This study aims at improving Korea's competitiveness in port logistics through marketing strategy with integrating the conceptual approach into the empirical one and combining both the oldest military treatise and the newest evaluating model in social science that was applied by the HFP(hierarchical fuzzy process) model enhanced by the KJ method.

The empirical results of this study show Busan in the middle among subject ports. At present, Korea plays a reciprocal role in the port market in East Asia, but in the medium- and long-term, Korea's ports will vie together with most major ports in the East Asian region.

A descriptive investigation shows that Korea's developing tasks in port logistics must be considered in the context of the direction for developing port policies, the necessity of expanding port facilities in the capital region, securing the sufficient traffic volume through the establishment of the hinterland linking system and its positive utilization, and reforming the direction for developing the global logistics through increased port competitiveness.

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In the short- and medium-term, Korea must use the opportunity factor of 'Growth and open door policy of China' as a geoeconomic advantage and to utilize Korea's ports as a gate to Chinese foreign trade. With the rise of China's economy, China also plays a significant role in both port and airport markets. Hence, the linking system between the two must be established to meet the expanding traffic volume, especially in the capital area. Moreover, it is necessary for Korea to secure port logistics through the establishment of the hinterland linking system and its positive utilization.

The great accomplishment of this paper is to present strategies to increase Korea's port competitiveness in the rapidly changing environments of world logistics with the focus on both the oldest military strategic treatise and the newest empirical method in social science. In order to reinforce this study, it needs further compensative research because the evaluation structure could be subdivided with more extensive and precise criteria.

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## I . Introduction

As globalization has changed the structure of the world economy, the port market in world logistics has evolved with several trends. Ship-building technology influences ship size and capacity, port facilities and wharves are being expanded, port management is more globalized, cargo handling equipments are increasingly effective, the WTO is more widely accepted and fast development of information communications technology(ICT) is benefiting from further advancement. We are entering into an era of the sky-high competition where maintaining competitive edge is the key to survival.

These circumstances have expedited changes in the new international maritime order(NIMO)<sup>1)</sup> that requires strategic planning<sup>2)</sup> for enhanced port competitiveness that has been a key factor in world logistics advancement in recent years. Since strategic planning minimizes risks in rapidly changing environments, the strategic development planning and efficient operations, along with continued evaluation and modification, are essential to long-term profitable business in port market which has been a leading role in world logistics evolution.

The strategic ideas of the oldest military treatise of 'Sun Tzu on the Art of War' are applicable in today's port logistics with the focus on the relevant market. Since this

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1) Jin-Goo Gim, "Korean Maritime Policies with Reference to the UN Code of Conduct for Liner Conferences", MSc Dissertation of Sea Use Law, Economics and Policy-Making, London School of Economics, September 1993.

2) Stock, J.R. and D.M. Lambert, "Strategic Logistics Plan", Strategic Logistics Management 2nd ed., Homewood, Illinois: Irwin, 1987, pp.689-690.

market is so various and dynamic that the relevant factors are worthy of noting the rapid changes related to the world logistics advancement in the 21st century.

To initiate new strategic planning to be an occupant of the world hub bases is critical for every port in the world. Hence, a hub-oriented port in the 21st century must be specialized in the port market and ICT in which world logistics has been evolved far and wide.

Since most traffic volume in import and export depends on maritime transport in world logistics, port in the 21st century can also be significant factors to determine the state of logistics.

In order to counter these rapidly changing environments of world logistics, the increase of port competitiveness is required through the higher berth productivity that will extend to the improvement of world logistics and economy as a whole.

This study aims at improving Korea's competitiveness in port logistics through marketing strategy with integrating the conceptual approach into the empirical one and combining both the oldest military treatise and the newest evaluating model in social science that was applied by the HFP(hierarchical fuzzy process) model enhanced by the KJ method.

This paper comprises five sections, dealing with I. Introduction, II. SWOT Analysis of Korean Ports, III. Marketing Approaches to Port Competitiveness, IV. An Application of Marketing Strategy to Improving Korea's Port Competitiveness in World Logistics, and V. Conclusion.

## **II. SWOT Analysis of Korean Ports**

### **1. Concept of Strategy and Preceding Task regarding Marketing Strategy**

In this rapidly changing world of today, especially in the field of shipping and ports in Korea, we need to ascertain the relevant environment in terms of the SWOT. In order to grasp the overall environmental changes, a strategic approach to the marketing strategy of Korea's port logistics is required. In order for us to analyse these dynamic changes related to the advancement of world logistics through the improved competitiveness of port, it is worthwhile to take account of the oldest military treatise in the world of 'Sun Tzu on the Art of War'. Generally, the strategic

meaning of 'If you know the enemy and know yourself, you need not fear the result of a hundred battles' refers to 'the significance of the analysis of environment' that is a process precedent of strategy.

'To know the opponent' refers to the external components of a Korea's port enterprise including competitors; 'to know oneself' connotes the internal components of a port enterprise.

## 2. SWOT Analysis of Korean Ports

If we analyze the enterprise itself, it has 'strengths and weaknesses'. Also, two components are related to the external environment of the enterprise that changes, which are 'opportunity' and 'threat'.

Change appears as a new opportunity to those who are prepared but as a threat to those who are not prepared. So change is called 'a threat'.

The proceeding task of strategy has to analyze strength·weakness of itself or opportunity·threat of itself. This process is called S·W·O·T analysis. The following diagram shows the factors worthy to be considered as check points of the marketing strategy for Korea to improve its port competitiveness.

<Diagram 1> Diagram of SWOT Analysis of Korean Ports

Strengths(S)	Weaknesses(W)
<ul style="list-style-type: none"> <li>○. Geographical superiority</li> <li>- Central location in Northeast Asia</li> <li>- Location on the main trunk: strategic location on the transport route of Northeast Asia to North America and Southeast Asia</li> <li>- Possibility of a gate port for Eurasian continents when TSR/TKR activated</li> <li>○. Intersection point of the continental economy and ocean economy</li> <li>○. Attractive level of port tariffs</li> <li>○. Sufficient traffic volume (Import/export and T/S cargo)</li> <li>○. Strong government willingness to develop Northeast Asian hub ports in Korea</li> <li>○. High portion of specialized fleet and</li> </ul>	<ul style="list-style-type: none"> <li>○. Shortage of port facilities due to insufficiency of port investment</li> <li>○. Lack of language skill</li> <li>○. Absence of hinterland logistics center</li> <li>○. Constraints in finance</li> <li>- Limited private sector participation</li> <li>- Insufficiency of port government budget</li> <li>○. Low level of globalization</li> <li>○. Insufficient manpower of logistical profession</li> <li>○. Lack of flexibility in labor market</li> <li>○. Underdevelopment of logistics industry</li> <li>○. Insufficiency of a supporting plan against the rise of ship's operation cost</li> <li>- Burden with heavy taxes for the</li> </ul>

<ul style="list-style-type: none"> <li>relative young age of the fleet</li> <li>○. High demand for self-transport with economic structure of foreign-depend type</li> <li>○. Relative advantages for securing ships with a world-class shipbuilding country</li> <li>○. Superior ICT infrastructure</li> <li>○. Securing low port cost</li> </ul>	<ul style="list-style-type: none"> <li>management of shipping business</li> <li>- Heavy operation cost due to the rise of ship's crew expenses</li> <li>○. Rigidity of port management system</li> <li>○. Inefficiency of port hinterland linking transport</li> </ul>
<p>Opportunities(O)</p> <ul style="list-style-type: none"> <li>○. Growth and open policy of China</li> <li>- world production and consumption base</li> <li>- Increasing demand for logistics activities</li> <li>○. Possibility of economic cooperation among Korea/China/Japan</li> <li>○. Possibility of land traffic connection between South and North Korea</li> <li>○. Increasing T/S cargo that uses Korean ports due to Japan's economy recovery</li> </ul>	<p>Threats(T)</p> <ul style="list-style-type: none"> <li>○. Severe competition of NEA countries</li> <li>○. Possibility of restructuring of Japanese ports</li> <li>○. Uncertainty of North Korea situation</li> <li>○. For a mega hub port, huge capital investment required</li> <li>○. Decreasing T/S cargo due to increasing direct calling at China's ports</li> <li>○. World shipping's paradigm shift</li> <li>- Changing from centering on the main trunk route linking Asia-America-EU to centering on China's shipping network</li> </ul>

Source: Country Level Seminar on Shipping and Port Development Strategies, UN ESCAP, April 2001; "The Development Strategy for Korea's Port to be a World Top-class Hub Port in the Era of World Competition," in The International Conference for Launching the Asian Journal of Shipping & Logistics, Seoul, Korea, October 22-23, 2008.

### III. Marketing Approaches to Port Competitiveness

#### 1. Marketing Approaches with Reference to STP Strategy

Strategy is a military parlance that means an army's operation in order to protect themselves from force of arms or by external threats.

Marketing is a battle with a competitor and market is a battle field.

These concepts can be applied to the port industry today.

Marketing strategy in the relevant field can be a process that allocates their resources or capacities to various activities to achieve the goal of individuals or organizations(enterprises).

Hence, Strategy can be understood as the allocation of resources or capacities in consideration of the STP(Segmentation, Target market selection, Positioning) including

5P marketing strategies such as products, pricing, promotion, path and privilege in the port market. That is, the strategy is first to nourish in the underfed areas and to eliminate waste of investment in the areas of overcapitalization.

We have to know not only part of lack but also part of excess to allocate resources in a variety of activities. First of all, the analysis of status or environment that enterprises or organizations face has to be made before the strategy is planned or executed.

In terms of the process of marketing strategy in the field of shipping and ports in Korea, the relevant marketing can be perceived as an activity or process to secure clients by moving consumers's minds; meanwhile, marketing strategy is a specific activity or plan that was selected to achieve the goal which secures clients in a given condition. Marketing strategy in the port field is to be accomplished after making the previous analysis of status. The marketing strategy to create clients through customers' satisfaction can be restructured by three processes as follows: Segmentation → Target market selection → Positioning. That is, it can be called the STP strategy in the relevant market. It segmentalizes a variety of customer groups, selects target groups to deal with in the future, and makes a desirable image to capture the attention of the target group.

### 1) Segmentation

Segmentation is the first stage. It is the process of dividing a whole market which contains a variety of clients' desires into many segmental markets with homogeneous wants. No enterprise can deal with every client; it is even impossible for the enterprise to satisfy all of them.

Market segmentation is the strategy to adjust clients' satisfaction and charges at a reasonable level. Thus, the purpose of market segmentation is to divide heterogeneous customers into comparatively similar characteristic groups according to various clients' wants and tastes, increase the level of their satisfaction by supplying the appropriate goods and services for the group, and simultaneously minimize the resources and efforts necessary to it.

Moreover, since there is not an enterprise with enough ability to deal with all the clients in the world, it is the strategy of market segmentation which allows it to choose and serve the sector of customers suitable to its ability. A market can be divided by market segmentation criteria by using people's external factors (demographic factors: gender, age, occupation, income, social class, nationality, climate, human race.) and people's internal factors (psychological schematic factors:

characteristics, lifestyles, attitude).

## **2) Target market selection**

Once the evaluation of market segmentation is completed, target clients must be selected. The selection of a strategy has to be made after reviewing some important components. This is target market selection.

Target market is the selection of one or more markets suitable for the enterprise itself among several segmented markets which were identified from the previous stage. Here, the criteria are those of 'usefulness' and 'advantageousness', which can choose target market. Usefulness is to mean market potentiality and advantageousness is to be a comparative advantage compared with competitors in the market. A market is to be selected on the basis of these criteria.

The first criterion is the ability to mobilize an enterprise's own funds or talent. All enterprises have a limit depending on their abilities. If they disregard this realistic limit and are avaricious, they will almost invite disaster; if they have resources enough to be mobilized, even disperse the resources to many markets and vie enough with competitors for all the markets, it will be advantageous for them to secure those markets with an all-out war at an early stage.

The second consideration is market characteristics. It is to what extent consumers know about commodities, and whether their requests are clearly met or not. In other words, it is a question of phase in the life cycle of goods. If the goods are now at the early stage, it is unreasonable for the market to segment itself; if the goods have reached 'puberty', market segmentation is essential.

The third point is what type of strategy that the rivals are taking. First of all, the strategy be taken will be different depending on whether there is no rival and no entry is expected in the near future; a rival already exists or an entry is about to be expected. Further, if the existing enterprise leads a comfortable sales on a large scale instead of introducing segmentation strategy, it will naturally need to choose target customers according to segmentation; if the enterprise has already used segmentation strategy, it will be desirable to use centralization strategy or adopt low price strategy as the weapon through non-differential targets.

## **3) Positioning**

The next consideration is positioning which means to occupy a position by letting clients know the existence of the enterprise and creating an image in their minds. This is accomplished much through advertisement. For example, we associate LSE with

'Social Science Studies', Korean Whiskey reminds us of 'Soju' and Disneyland is reminded of 'Amusement Park'. In other words, positioning is to affect clients' purchase and consumption behaviors by creating a special image that differentiates from the rival in clients' minds so as to grasp the minds of target clients. Therefore, the ultimate purpose of positioning can be said to realize the competitive monopoly through differentiation.

Market segmentation and target customers selection are essential basic consideration to increase clients' satisfaction and to achieve an enterprise's own marketing goal. But it is only a seller's unilateral decision. What these selected target clients are going to prefer from the rivals is completely another question. From now, hence, the work to establish a monopolistic position through competition becomes needed by currying favor with target customers and drawing their preferences. The only way is to create and supply the differential value that can satisfy target clients much more than the competitors. In order to create the differential value, we have to clearly recognize the following two facts.

First, it is not important for differential value to differ between competitors but meaningful for target clients to consider that difference important and give more value. Thus, differential criteria are to be thoroughly target clients and to have a same frame of recognition with them. For this, it is necessary for marketers to find out recognition chart and the position that target clients think ideal.

Second, there must be innovation to make this position one's own. Differential value is not created by advertisement or words but by following the practical efforts to realize it. There are basically two ways in positioning like this. One is the law of prior occupation. It is first to show a new product or service in the market. Next is to use the image that already represents the firm position.

## 2. Strategic Approaches to Improved Port Competitiveness

In order to improve the berth productivity, port management must consider the following factors<sup>3)</sup>:

- 1) Factors depressing throughput level
- 2) Different levels of port systems and their major influences

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3) For detailed information, see Gim, Jin-Goo & Jong-In Lee, "Integrated Approaches to Berth Productivity Improvements in Port Development and Operation and Logistics: A Conceptual Perspective", *The Journal of the Korean Institute of Port Research*, Vol.11 No.1, June 1997, pp.87-94.

- 3) Enhanced port competitiveness through strategic approaches to port development
- 4) Different time phase in strategic port development planning for enhanced port competitiveness
- 5) Berth throughput increase
- 6) Traffic forecast
- 7) Berth productivity measurement

## IV. An Application of Marketing Strategy to Improving Korea's Port Competitiveness in World Logistics

Under these circumstances, the related logisticians must have a practical understanding of how the strategic planning process works in relation to the port marketing strategy to improve the relevant competitiveness. Since port is a critical factor of the production function in port logistics, the relevant productivity improvement is bound to lead to an increase of the logistics productivity. Hence, it is necessary for logisticians to know how to identify and evaluate port competitiveness that comprises complicated and widely different factors in today's rapidly changing environments of world logistics after a brief review of the relevance.

### 1. Methodology

To meet these requirements this study adopts the HFP(hierarchical fuzzy process) method in order to overcome the problems<sup>4)</sup> and on the basis of representative evaluation attributes by KJ method<sup>5)</sup> to evaluate port logistics ability of Korea and

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4) The HFP technique performs a mathematical operation in consideration of the interaction among attributes and is used for evaluating port competitiveness by converting its qualitative property into a quantitative one. It is regarded as a superior technique to similar evaluating methods such as analytic hierarchy process(AHP), hierarchical fuzzy integral(HFI), and system dynamics(SD) in that the HFP model has merits such as a newest modelling technique in social science and management as well as cybernetics and its resultant superiority, converting a probable measure into a fuzzy measure, relative advantages of cost-cut and time saving compared with the others. For further theoretical background on port competitiveness and its modelling techniques, see Jin-Goo Gim, "A Study on Competitiveness of Container Ports in International Logistics Strategies - With the Focus on Southeast Asian Countries - ", Doctoral Thesis, Korea Maritime University, Dec. 2002. pp.11-37.

5) KJ method is a structuralization technique that man intends to utilize his intention and

some competing nations. This methodology provides some grounds to transform probability measures to fuzzy measures to find out the integrated value of evaluation. This is done by converting the measure of probability that was extracted from dual comparison by the analytic hierarchy process(AHP) method into fuzzy measures, and conducting fuzzy integrals.

In recent years, cybernetics-related studies such as artificial intelligence, behavioral science, and human engineering have found many applications in all fields of engineering that have been extended to the fields of social science, policy making, port, transportation and logistics(Gim, 2000 and 2003). How to control man-machine systems in terms of problem-solving of human subjectivity such as human abilities of judgment, analogy based on experience, and adaptation to any unfamiliar environment which are contrasts to machine objectivity in engineering-related fields, has become considered significant. Considering human subjectivity among man's characteristics which are superior to those of machines, the concept of fuzzy sets has provided a powerful means to deal with subjectivity by methods as in mathematics or engineering.<sup>6)</sup>

In order to tackle these kinds of problems, it is necessary for us to apply strategic approaches as a means of integrated approaches to enhanced port competitiveness in world logistics by utilizing the HFP model.

The following is an application process for the HFP method. First, find out the weight of evaluating items and the interaction coefficient between evaluating items by the AHP method. Second, derive the fuzzy measure by utilizing the weight of

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experience. This method has been known as a very effective technique at the beginning of system development. Selected representative attributes for port competitiveness by the KJ method comprise port location, port facilities, cargo traffic, port expenses and service level. For further detailed information on the extraction of evaluation components of port competitiveness, see Jin-Goo Gim, Dec. 2002, pp.106-112.

- 6) Zadeh L. A., expounded his ideas on "Fuzzy Sets," in his paper in *Information and Control*, Vol.8, 338/353, 1965. Since then, fuzzy sets theory have been widely applied in linguistics, algorithm, automata, pattern recognition, system engineering, and nowadays even in social science. Here, fuzziness can be defined as a kind of uncertainty caused by subjectivity, whose concept corresponds to randomness in probability theory caused by objectivity that is random phenomena such as objective and physical phenomena. In this context, fuzzy measures are subjective scales for fuzziness, which are set functions with monotonicity that have not necessarily additivity, while the set functions having been investigated in mathematics are mostly endowed with additivity such as Lebesgue measures. And fuzzy integrals are defined as the functionals with monotonicity defined by using fuzzy measures. For their applications, see M. Sgeno, "Theory of Fuzzy Integrals and Its Applications", *Doctoral Thesis*, Tokyo Institute of Technology, 1974.

evaluating items and the interaction coefficient among evaluating items. Third, extract the evaluated value from the source or by evaluation. Fourth, conduct the fuzzy integral using the evaluated value and fuzzy measures. The fuzzy integrals thus obtained can be used as the integrated evaluation of the model.

Basic characteristics of fuzzy integrals lie in monotonicity that reflects the property of fuzzy measures. Where set  $X$  is a finite set, if function  $h$  is arranged in size order like  $h(x_1) \geq h(x_2) \geq h(x_3) \cdots \geq h(x_n)$ , fuzzy integrals can be represented as the following formula.<sup>7)</sup>

$$\int_A h(x) \circ g(\cdot) = \bigvee_{i=1,n} [h(x_i) \wedge g(F_i)]$$

$$\text{But, } F_i = \{ x_1, x_2, x_3, \cdots, x_i \}$$

## 2. Extraction of Evaluating Data on Port Competitiveness

In order to examine the empirical value of competence criteria, representative attributes, which are easy to collect quantitative data and can decide the scope, should be defined.

For port location, the detailed attributes include frequency of liner calls, geographical location, hinterland economy, and future development possibility. Of these detailed attributes, however, geographical location, hinterland economic condition, and future development possibility have some difficulties with respect to quantitative analysis, so frequency of liner operations is adopted as a representative attribute in this study to find out empirical data.

For port facilities, wharf facility, handling equipment and storage facility are included. Among these, the berth length could be the representative attribute because number of berths, equipment, and storage ability are usually dependent on the length of the berth.

For cargo traffic, the throughput volume handled at the port was the basis of the evaluation, and includes export/import and transit cargoes.

Port expenses include navigation expense, berth service fees, cargo handling charges, lease and other business related costs.

Lastly, for service level, some studies see the operational hours of harbor service as

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7) M. Sgeno, Terano T. & Asai, K., "フアジシステム入門," オーム社, 東京, 1980.

the measure of port service. However, since ports in Korea and China keep regular operational system for 24 hours a day throughout the year, it is meaningless as a measure of comparison. Thus, this study adopted the information service level of the port as the key service standard which shippers, ship owners and stakeholders have required in cargo handling information within ports, cargo tracing information, port management information system and various relevant fields.

<Table 1> shows the arrangement for defining the criteria of port competitiveness and representative attributes.

<Table 1> Port competitiveness criteria and representative attributes

Criteria	Port location	Port facilities	Cargo volume	Port expense	Service level
Representative attributes	# of liners calling at	Berth length	Handling volume	Actual cost	Port information process service

### 3. Application of Strategic Approaches to HFP

In order for Korea's port competitiveness to be improved, the integrated approach is essential by evaluating both theoretical and empirical analyses and applying them to the port market. Furthermore, the subjectivity has to be evaluated that can be disregarded in most cases of manufacturing and distribution markets, whereas the qualitative approach to the port market is essential because the peculiar privilege therein has to be considered. Hence, this study adopted the integrated evaluation by fuzzy integral to tackle the aforementioned problem. The evaluation can be obtained through the following sequence :

- 1) computation of Evaluation Weight  $w(\cdot)$  by Items
- 2) computation of Interaction Coefficient  $\lambda$
- 3) computation of Fuzzy measure  $g(\cdot)$
- 4) computation of the value of fuzzy evaluation  $h(\cdot)$  of fuzzy item

The results of fuzzy integral by port and degree of port competitiveness<sup>8)</sup> are shown in <Table 2>.

8) For further information on the HFP analysis, see Jin-Goo Gim, "The Evaluation Analysis of Competitiveness among Target Ports with Environmental Changes of Global Logistics," Journal of Korea Port Economic Association, Vol.19 No.2, Dec. 2003, pp.18-26.

<Table 2> Results of fuzzy integral by port and degree of port competitiveness

Port	Evaluation item $h(\cdot), g(\cdot)$	Procedure of Fuzzy evaluation					Fuzzy Integral (degree)
Busan	Evaluation item <sup>1)</sup>	4	5	3	2	1	0.492
	Fuzzy evaluation $h(\cdot)$	0.750	0.590	0.492	0.465	0.417	
	Fuzzy measure $g(\cdot)$	0.203	0.362	0.572	0.754	1.000	
Hong Kong	Evaluation item	1	4	3	2	5	0.659
	Fuzzy evaluation $h(\cdot)$	1.000	0.900	0.778	0.619	0.251	
	Fuzzy measure $g(\cdot)$	0.246	0.449	0.659	0.841	1.000	
Kaohsiung	Evaluation item	4	3	2	1	5	0.594
	Fuzzy evaluation $h(\cdot)$	0.700	0.635	0.631	0.412	0.410	
	Fuzzy measure $g(\cdot)$	0.181	0.413	0.594	0.754	1.000	
Manila	Evaluation item	5	4	3	2	1	0.572
	Fuzzy evaluation $h(\cdot)$	1.000	0.800	0.651	0.451	0.158	
	Fuzzy measure $g(\cdot)$	0.159	0.362	0.572	0.754	1.000	
Port Klang	Evaluation item	5	4	3	2	1	0.492
	Fuzzy evaluation $h(\cdot)$	0.748	0.600	0.492	0.449	0.177	
	Fuzzy measure $g(\cdot)$	0.159	0.362	0.572	0.754	1.000	
Shanghai	Evaluation item	4	5	1	3	2	0.362
	Fuzzy evaluation $h(\cdot)$	0.736	0.750	0.310	0.270	0.233	
	Fuzzy measure $g(\cdot)$	0.159	0.362	0.609	0.819	1.000	
Singapore	Evaluation item	2	3	4	1	5	0.841
	Fuzzy evaluation $h(\cdot)$	1.000	1.000	1.000	0.941	0.326	
	Fuzzy measure $g(\cdot)$	0.181	0.391	0.594	0.841	1.000	
Tanjung Priok	Evaluation item	5	4	3	2	1	0.413
	Fuzzy evaluation $h(\cdot)$	0.669	0.600	0.413	0.144	0.137	
	Fuzzy measure $g(\cdot)$	0.159	0.362	0.572	0.754	1.000	
Tokyo	Evaluation item	4	2	3	1	5	0.382
	Fuzzy evaluation $h(\cdot)$	0.750	0.382	0.349	0.146	0.143	
	Fuzzy measure $g(\cdot)$	0.203	0.384	0.594	0.841	1.000	

Note 1) : 1(port location), 2(port facilities), 3(cargo traffic), 4(port expenses), 5(service level)

#### 4. Scheme for Increasing the Competitiveness of Korea's Port Logistics in World Logistics Advancement

Korea's development tasks in port logistics must be considered in the direction for developing port policies, the necessity of expanding port facilities in the capital region, securing the sufficient traffic volume through the establishment of the hinterland linking system and its positive utilization, and the reforming direction for developing the world logistics through the higher port competitiveness.

##### 1) Directions for port policy

First of all, Korea must use the opportunity factor of 'Growth and open door policy of China' as a geoeconomic advantage and to utilize Korea's ports as a gate for Chinese foreign trade. The port linking system between Korea and China has to be established with its main object which, "All ports of Korea also belong to those of China in terms of port logistics and trade."

Moreover, Korea must take positive measures in the rapidly changing port market today and leave open the relevant laws and customs to accommodate those of China. Then, Korea is more likely to be a country which provides world shippers with the services that will suit their demands. By doing this, Korea's ports will be those for which the shippers have a preference in the relevant market in East Asia, especially in Northeast Asia.

In order for Korea's container ports such as Busan to advance to the next stage, change is not one of gradual improvement or additional efforts, but epoch-making strategies and great and fundamental changes in the operation method and the consciousness of those employed in the port industry.

Taking account of the comparative results of port competitiveness, Korea should present a variety of strategies and directions for policy-making so that its ports can gain the upper hand in competition with our competitive ports such as Shanghai.

Busan must offer much better conditions for inducing the package-type FDI than those of the Great and Little Ports of Shanghai not only to existing investment enterprises such as HPH, but also to global shipping companies(GSC) and MNC from which new investment is expected.

Gwangyang has to attract the proposer fitting and package-type FDI by international public invitation which can maximize the advantage of the late comers in port construction, forming the hinterland complex, urban infra facilities and friendly water

space, etc.

Korea port authority must prepare an overall scheme that can induce the shipping lines and shippers in addition to the competitive advantage strategy and attract multinational 'anchor' enterprises to the hinterland complex.

Further it has to prepare the scheme for inducing the shippers of the large shipping lines and global companies' shippers directly to ports and the hinterland rather than mainly depending on GTO(Global Terminal Operator) such as HPH and PSA when Korea introduces the FDI in the New Port Development.

## **2) Necessity of expanding the port logistics in the capital area**

With the rise of China's economy, the reality is that China also plays a significant role in the port market. The main trunk line in East Asia has formed following the route of EU-Singapore-Hong Kong-Kahosiung-Busan-Kobe-America up to now, but in recent, new routes which start from China's ports to Europe/North America have been gradually formed.

Therefore, it is necessary for Busan and Gwangyang ports to amend the traditional pattern of operating the previous trunk line from which China's ports were excluded. Unless the ports in the capital area including Songdo-New Port are developed in time, it cannot be excluded that the cargo for Korea may be transhipped via China's ports.

In order for Incheon Port to be the international trade hub-port in the Yellow Sea-Rim Economic Bloc, the container liner services between Incheon-China and Incheon-Japan should be expanded.

It is necessary for the Korean port authority concerned to correct as soon as possible the inefficient logistics-biased phenomena since it is inefficient in the present pattern which part of the cargo in the capital area including Incheon has been transported to China via Busan Port and/or Gwangyang Port.

## **3) Securing the port logistics through the establishment of the hinterland**

linking system and its positive utilization

In order for Korea to function as a business and logistics hub in Northeast Asia, it has to improve the accessibility to the Northeast Asian market by adopting the latest technology and improving the efficiency of the port infrastructure(ports and hinterland logistics complexes).

It is important for Korea government to realize the fact that Busan Port is a world-class port in terms of cargo throughput but very weak in the value-added logistics services. Thus, it has to forward Korea's national strategy for reinforcing the

international competitiveness of Busan Port, Gwangyang Port and ports in the capital area so as to maximize the function as the international logistics hub in Northeast Asia.

#### 4) Directions for reforming Korea's port logistics

In order to maintain an amicable relation between labor and management, Korea government must apply laws and regulations flexibly with civil officers's positive attitude and establish the decisive administration.

Finally, to speed up localization and privatization of Korea's port logistics, it is essential for Korea to restructure the organization of port management through greater localization and privatization and capitalize on the citizens' professional efficiency by privatizing port operation.

## V. Conclusion

Strategic approaches to improved port competitiveness minimize risks in rapidly changing environments in world logistics advancement. The relevant strategic approaches and efficient management, along with newest evaluation technique of the competitiveness, are essential to long-term profitable undertaking in port logistics.

In highly industrialized market economy systems of today, curtailment of expenditure arises not only at the level of an enterprise but also as problems at a country level. Curtailment of logistics costs through the improvement on the part of logistics, related services and creating profits are critical in terms of national competitiveness. Since ports play a leading role in world logistics and every country seeking higher port competitiveness that is a key factor in world logistics advancement and has created the hub-port in the 21st century, more emphasis has been placed on ports than ever before in both theoretical and empirical perspectives.

Of the two approaches, the utmost importance is how to identify the bottlenecks and to tackle the problems effectively. Derived from these, the conceptually integrated perspectives were applied to empirical approaches by adopting a newest evaluation technique, HFP, which is the merit of this study. This technique requires marketing strategic approaches to comprehensive measures since none of the two can be a solution independently and disregard the empirical components which are crucial factors in the port market.

In recent years, especially in the East Asian region countries have taken great interest in creating a hub-port and established a port investment plan to handle export and import cargo smoothly and affect the economy greatly.

In this context, this study examines status of competitive ports in different countries, identifies components that lead actual competition, use the grasped components to evaluate the competitiveness. The results of this study are enumerated as follows.

First, conceptual approaches to the marketing strategy were executed by excerpting the relevant factors today from the strategic treatise, 'Sun Tzu on the Art of War'. This invaluable information can be applicable to today's dynamic port market, and contribute to improving port competitiveness that is a key factor to the world logistics advancement.

Second, the port in general is to function as a bridge that transfers cargo from seaside to landside and vice versa. These perspectives dealt with factors depressing throughput level, different levels of port systems and their major influences, higher port competitiveness through strategic approaches to port development, and different time phase in strategic port development planning for the improvements of port logistics. In particular, the increase of port competitiveness can be obtained through higher berth productivity. It is the berth in the port which functions as a link between sea/land sides and for which traffic must be forecasted, productivity assessed and throughput increased.

Third, the conceptual approaches to the marketing strategy were applied to empirical studies on strategic approaches to enhanced port competitiveness by adopting the HFP method.

Fourth, various attributes of port competitiveness through previous studies were reviewed to evaluate port competitiveness. Five representative evaluation attributes - port location, port facilities, port expense, cargo traffic and service level - were obtained on the basis of detailed attributes of port competitiveness. These are essential attributes in the marketing strategy that can contribute to improving the port competitiveness.

Fifth, the obtained evaluation attributes were used to form the evaluation structure of multi-attributes and multi-classes. The port competitiveness of different countries including Korea was evaluated by applying the Algorithm of HFP presented in grasped multi-attribute and multi-class evaluation.

Sixth, the empirical results of this study show Busan in the middle among subject ports. At present Korea plays a reciprocal role in the port market in East Asia, but in the medium- and long-term, Korea ports will vie together with most major ports in

the East Asian region.

Seventh, a descriptive investigation shows that Korea's developing tasks in port logistics have to be considered in the context of the direction for developing port policies, the necessity of expanding port facilities in the capital region, securing the sufficient traffic volume through the establishment of the hinterland linking system and its positive utilization, and reforming the direction for developing the world logistics through the higher port competitiveness.

Eighth, in order for Korea to increase the competitiveness of port market in East Asia, especially in Northeast Asia in the short- and medium-term directions for port policy, it, first of all, has to use the opportunity factor of 'Growth and open door policy of China' as a geoeconomic advantage and to utilize Korea's ports as a gate to Chinese foreign trade. The port linking system between Korea and China has to be established for its main object which, 'All ports of Korea also belong to those of China in terms of port logistics and trade'.

Ninth, to take positive measures against the rapidly changing port market today, Korea has to leave open the relevant laws and customs in order to accommodate those of China. Korea will be such a country which provides world shippers with the services that will suit their demands. By doing this, Korea's ports must be those for which the shippers have a marked preference within the relevant market in East Asia, especially in Northeast Asia.

Tenth, with the rise of China's economy, China also plays a significant role in both port and airport market. Hence, the linking system between the two has to be established to meet the expanding traffic volume, especially in the capital area. The main trunk line in East Asia has been established following the route of EU-Singapore-Hong Kong-Kahosiung-Busan-Kobe-America up to now, but in reality, new routes which start from China's ports to Europe/North America have been gradually formed. So, it is necessary for Busan and Gwangyang ports to amend the traditional pattern of operating the previous trunk line that excluded China's ports. It is noted that unless the ports in the capital area including 'Songdo-New Port' are developed quickly, the possibility cannot be excluded that the cargo for Korea may be transhipped by way of China's ports.

Eleventh, for Korea to function as a business and logistics hub in Northeast Asia, it is required to improve the accessibility to the Northeast Asian market by increasing the efficiency of its port infrastructure. Busan Port is a world-class port in terms of cargo throughput but very weak in the value-added logistics services. To tackle this problem, Korea has to advance its national strategy for reinforcing the international

competitiveness of Busan Port, Gwangyang Port and ports in the capital area, which will lead to the maximization of its function as the international logistics hub in East and especially, in Northeast Asia.

Twelfth, directions for reforming Korea's port logistics must include: to apply laws and regulations flexibly with civil officers's positive attitude, to maintain amicable relations between labor and management, to establish a decisive administrative structure, to restructure the organization of port management through greater localization and capitalize on the citizens' professional efficiency by privatizing port operation. The harmonization of all the measures will lead to speeding up localization and privatization of Korea's port logistics.

In terms of the main contributions of this study, it has combined approaches to both conceptual and empirical studies in the port logistics market. Therein, the strategic conceptual approaches of the oldest military treatise of 'Sun Tzu on the Art of War' were applied to today's rapidly developing world logistics, focusing on the port market. Further, these integrated and strategic approaches adopted the advanced HFP model in social science which was enhanced by the KJ method to evaluate the competitiveness of subject ports. The great accomplishment of this paper is to present strategies to increase Korea's port competitiveness in the rapidly changing environments of world logistics advancement with the focus on both conceptual and empirical approaches in both the oldest military strategic treatise and the newest empirical method in social science.

In order to reinforce this study, further compensative research is necessary because the evaluation structure could be subdivided with more extensive and precise criteria. Further studies would be needed to excerpt more strategic ideas on the treaties by Sun Tzu and apply them to the port marketing strategy that will help to improve the relevant competitiveness today. The reinforced research will be able to enhance the competitiveness of Korea's port logistics contributing to the national economy as a whole.

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< 요약 >

# 세계물류발전과 한국항만의 경쟁력 강화를 위한 마케팅 전략

김진구

본 논문의 목적은 해운항만산업의 마케팅 전략을 통한 한국 항만물류의 경쟁력 향상에 있다. 연구 방법론은 고대와 현대의 이론을 검토하여 기술적 연역과 실증적 분석의 조화를 통해 사회과학분야의 최신 종합적 접근법으로서 구조화 수법인 KJ방법으로 강화시킨 계층퍼지분석기법(HFP모델)을 적용하여 세계물류의 근간이 되고 있는 항만경쟁력 향상의 방안도출과 분석 결과의 평가에 활용되었다. 실증분석의 결과 한국의 대표적 항만인 부산항은 동아시아의 해운항만시장에 있어서 연구 대상항만 중 경쟁력은 중간수준정도로 평가되었다. 현재 한국은 동아시아지역내의 주요 항만들과 경쟁과 상호 보완적인 역할을 하고 있으나, 중·장기적으로 볼 때 선박의 대형화와 고속화 등으로 동아시아의 모든 항만들과 경쟁관계에 놓일 것이다. 기술적 연역에서 한국 해운항만물류의 발전을 위한 주요과제로는 항만정책 개발, 수도권지역의 항만시설확충, 배후부지 연계시스템 구축과 이의 적극적인 활용을 통한 충분한 물동량 확보, 그리고 항만 경쟁력제고를 통한 세계물류발전을 위한 조합적 관계구축의 필요성을 나타내고 있다.

중·단기적으로 한국은 중국의 성장과 개방정책의 기회요인을 지리적 장점으로 이용하여 우리나라 항만을 중국교역의 대외관문으로 활용해야 할 것이다. 중국경제의 부상과 더불어, 중국은 또한 항만과 공항에 있어서 공히 중요한 역할을 담당하고 있다. 따라서 이러한 양자 간의 연계시스템은 특히 수도권에 있어서 팽창일로의 물동량에 대처하기 위한 시설 확충이 강화되어야 할 것이다. 아울러 한국은 적극적인 행운항만 배후연계체계 구축을 통한 물동량확보를 위해 기반시설의 효율화와 이의 적극적인 활용을 통하여 동북아는 물론 동아시아 전체에로의 접근성을 향상시켜야 한다.

본 연구의 기여도는 해운항만 물류시장에 있어서 시공을 초월하여 21세기 현대에 있어서도 기업과 국가의 경영전략에 유용한 순자의 '손자병법'논문을 관념적 접근과 HFP기법을 통한 실증적 연구를 조화시킨 최초의 논문이다. 더욱이 이와 같은 종합적인 전략적 접근은 현대 사회과학분야에서 진전된 연구 기법으로 평가되고 있는 HFP모형을 채택하고 있다. 이러한 기법은 항만경쟁력 평가에 구조화 수법인 KJ방법으로 강화시켜 급변하는 세계물류환경에 있어서, 한국의 해운항만경쟁력 향상을 위한 실용적 방안구축에 기여하고 있다. 본 논문을 보다 강화시키기 위해서는 평가구조상 보다 더 광범위하고 세밀한 표준치로 세분화 할 수 있을 것이다. 더욱이 본 논문은 손자병법논문에서 보다 다양한 전략적 자료를 발굴하여, 오늘날의 해운항만 마케팅 전략에 원용하여, 이와 관련된 한국의 해운항만물류 경쟁력을 강화시킴으로서 전체적으로 국가 경제발전에 이바지 할 수 있을 것이다.

□ 주제어 : World logistics, port logistics, hierarchical fuzzy process, integral approach, berth productivity