Journal of the Korean Institute of Navigation
Pusan Korea, Vol. 25. No. 4., pp. 393~406, 2001

A Study on the Singapore Port's Strategy to the Changing Environments and Implications for Busan Port

*Sang-Youl Kim**

항만경영환경변화에 따른 싱가폴항의 운영전략에 관한 연구

김 상 열*

〈Contents〉

Abstract
I. Introduction
II. Recent Trend for the 21st Century Hub Port
III. The Port of Singapore's Strategy
IV. Comparative Analysis of Port of Singapore's Strategy and Implications for Busan Port
V. Conclusion
Reference

요 약

최근 국제물류관리는 세계화기업의 초국가적 글로벌 경영활동과 고객욕구의 다양화로 인해 기업경영에 있어 중요한 요인으로 대두되고 있다. 특히 물류관리에 있어서 항만은 주요 지역거점 물류체계의 구축과 국제물류관리의 집중화 및 통합화로 인해 공급사슬체인상에서의 기능 및 역할의 변화가 요구되어 지고 있다. 이러한 맥락에서, 본 연구는 지속적인 국제물류환경 변화와 해운환경 변화로 인해 새로이 요구되는 중심항만의 기능과 역할을 분석하고, 항만경영환경 변화에 성공적으로 대처하고 있는 싱가폴항만의 대응전략을 연구·분석하고자 한다. 또한 부산항과 싱가폴항의 비교분석을 토대로 부산항이 21세기 항만경영환경변화에 대한 대응전략을 제시하고자 한다.

I. Introduction

Ports are now no longer considered as an end, but a link, in the transportation chain. Not only the port are fulfilling the role of the interface between land and sea transportation, but are integrating activities to 'add value' to the transportation chain. Hub ports are becoming 'load centres' with a host of shipping related activities and its operation supported by a high level of

* Full Time Lecturer, Department of Distribution Management, Dongeui University

information technology and automation.

The Port of Singapore has carried a laurel of "World Busiest Port" since 1986 in terms of shipping tonnage. Besides its strategic geographical location, the efficient port operations and a variety of reliable services, including cargo handling, warehousing, distribution, bunkering and ship supplies have been main factors that enable the Port of Singapore to have a reputation as it is today. The main objective of this paper is to study PSA's strategy and management system in response to the changing international logistics and shipping environment. To respond successfully to the changing environment and to become a hub port, the long term strategy and efficient port management system for Busan port should be developed without delay.

This study, firstly, outlines recent trends for the 21st century's hub ports and secondly, analyses the port of Singapore's strategy to respond to the changing environment including strategy for global network, partnership with neighbouring ports and shipping companies, infrastructure development, privitization, and port operation system. Thirdly, this research compares the port of Singapore with the port of Busan, highlighting the similarities and differences. Finally, by the analysis of factors responsible for the success of the port of Singapore as a transshipment hub, this paper is concluded with some lessons for the port of Busan.

Ⅱ. Recent Trend for the 21st Century Hub Port

Efficiency of inland transport to serve an increasing, and most often disputed, hinterland, has become a critical factor of the ports' potential future, as well as of overall trade growth prospects. Port authorities are likely to have a major role to play in fostering the development of an effective cooperation between interested public and private players, which will be required to achieve the expected benefits of integrated transport and logistic operations. The institutional context, as well as the ownership of assets and managerial framework, must be conducive to an optimal cost-effective utilization of port facilities. This supposes openness to competition in provision of port services, and establishment of appropriate regulations where market conditions make it necessary. Physical and regulatory integration of transport networks, as well as comprehensive strategies for addressing development planning and environmental and social issues, will also be required to allow national port systems to provide local and regional economies with the services they need. All this supposes the development of new partnerships between public and private actors, between ports and their customers, and between ports and port operators themselves.

2.1 Participation of Private Sector in Port Facilities

The private sector has significantly increased its involvement in the operation of port facilities during the 1990s, after the development of public service ports had clearly dominated the port sector since the 1940s. Between 1990 and 1998 a total of 104 port projects with private participation reached financial closure in 24 developing countries involving investment commitments totaling over US$ 8 billion.[1)]

During the past decade, the reform of port administration gained momentum in developing

1) Singapore Economic Development Board (2000). SEDB Annual Report 2000.

countries with public port agencies moving away from the service port model, under which the port authority provides both all commercial services and the regulatory functions. Instead many countries have adopted the landlord model for the administration of seaports under which port authorities continue to own basic infrastructure assets and retain regulatory functions but divest themselves of the managerial and financial responsibilities for commercial facilities.

The increasing involvement of the private sector in the management of port facilities has resulted mainly from a growing demand for expansion and modernization of port infrastructure in a context of limited public sector resources and growing consensus in favor of private participation in infrastructure. Strong growth of world trade has put enormous political pressure on authorities to improve handling efficiency and to expand facilities to accommodate larger ships and cargo flows. The potential of lucrative container transshipment business for strategically located, well equipped, and efficiently managed hub ports has in addition provided strong incentives on behalf of port authorities to invest in port modernization.

Economy of scale in the shipment of cargo has also led to the consolidation of distribution and logistics companies and to the emergence of global players. These shipping companies hold considerable market power related to the adjustment of port facilities to meet their specific needs. Similarly, global players are also emerging on the terminal operations side, with a few operators expanding new networks across regional boundaries. (See Table 1)

〈Table 1〉 Multi-Port Operating Companies

Multi-port operating company	No. of port operating world wide	Country
P&O	22 container terminals	Australia, New Zealand, Philippines, Pakistan, India, Malaysia, China, Argentina, Mozambique, Russian Federation, Sri Lanka, Thailand and the UK
Hutchinson Port Holdings (HPH)	17 terminals	Indonesia, China, the Bahamas, both sides of the Panama Canal, Myanmar and the UK
Stevedoring Services of America (SSA)	12 terminals	Mexico, Panama, Thailand, India and Indonesia, United States, and Canada
PSA Corporation	11 terminals	China, Cambodia, Indonesia, India, Thailand, Vietnam, Brunei Darussalam, Italy, Portugal, and Yemen
International Container Terminal Services Inc. (ICTSI)	7 terminals	Philippines, Manila, Mexico, Saudi Arabia, Pakistan and Argentina

Source: Constructed by author based on Port Newsletter (1999), UNCTAD, UN.

2.2 Roles of the Port Authority

The characteristics of the public sector mandate, as described above, call for the establishment of a well-defined public authority to deliver the duties and services associated with it. This will usually be a Port Authority vested with all regulatory and statutory powers requested to ensure sound operations of the port facilities.

The necessity to establish a public Port Authority is sometimes questioned. However, a review of prevailing situations worldwide shows that in an overwhelming proportion, the choice is being made to vest the specific regulatory powers

required to manage the provision and development of port activities into a Public Port or Marine Authority, either at a local or national level, depending on the size of the countries. This stems from the need to have a clearly identified public partner to act as a counterpart to the private sector in negotiating and implementing new operational and development formula for the port sector. The lack of such authority easily accessible at the local level can quickly become a significant impediment to a balanced development of effective public-private partnerships.[2)]

Trade and transport facilitation advocacy will usually mean a major role for the Port Authority in spearheading the development of electronic information interchange between all stakeholders in port-related trade activities. Ports have already been, in most instances, at the core of the move towards developing and implementing Electronic Data Interchange (EDI) systems between the ports themselves and between ports and their trading partners, including administrative authorities like customs.

2.3 Port Operations

The recent trend of port operation can be summarized as the continuing integration of transport modes and services, and cooperation between ports. The development of intermodal routes has increased inter-port competition for ship calls and cargo. It has also reduced the relative importance of ports in the logistics chain. The focus on door-to-door movements has changed the role of ports from a node for transferring cargo between modes to a link in the transport chain. As private transport companies have integrated their services across modes and shipping lines have become more concerned with the landside delivery of cargo, the ports customer base has changed from individual shippers and consignees to forwarders and transport operators. These companies apply international standards in their negotiations for better services and lower prices in their deals with port authorities and terminal operators. One result is increased volatility of commercial positions in face of the growing number of routing alternatives. This in turn could make investments in new port infrastructure a riskier proposition for the private sector, unless some mitigating strategies are implemented between the various actors to secure a minimum business base.[3)]

A possible way for ports to mitigate the consequences of this trend might be to enter into cooperative agreements on a local/regional basis, in particular in geographical areas that lend themselves to a flexible traffic distribution pattern through several port outlets. Finding the right balance between cooperation and competition, so that customers can get the best possible deal without jeopardizing the possibility to mobilize long-term private finance to develop infrastructure facilities, is likely to become one of the most important challenges in the port industry in the years ahead.

2.4 Port Management

Globalization of trade and the development of larger trade areas have led to shipping and intermodal alliances to handle the global nature of the supply chain. Shipping companies have merged, with P&O/Nedlloyd and Neptune Orient Lines/American President Lines expanding their

2) Port privitisation conference 1994, London. by Port Development International. November. p.41
3) Lim, D. (1996). Global Ports of the 21st Century. SingaPort96 and SibCon96 Conferences, Singapore.

geographic reach to create global service networks. Similarly, terminal operators have kept pace, globalizing operations to offer their shipping customers consistent services over diverse trade routes. A few significant trends are development of a few large terminal operators, operating internationally across national and regional boundaries and growth of a second generation of regional operators.

The development of the hub and feeder network with the resulting transhipment activities has led to the emergence of multi-port operating companies, such as Hutchinson Port Holdings, P&O ports, PSA Corp, Stevedoring Service of America and International Container Terminal Services Inc. which operate dozens of terminals around the world[4]. These terminals can be considered fourth-generation ports as they provide standard facilities with common operating and administrative systems. The pooling of information technology, administration, sales and marketing functions will save significant sums of money. Formed after the acquisition of Sealands international liner shipping operations by Maersk, CSX World Terminals is also now becoming a major player in the market. Activities of such companies as P&O, HPH, PSA Corp., SSA and ICTSI are a clear indication of a new trend towards increasing internationalization of terminal operations. Hence the thrust towards enhanced global network management practices by shipping and terminal operators alike, which is putting increased demands on intermodal land interfaces so as to make available as large an array of transport routes as possible, and to benefit from the result of increased flexibility in management of international transport operations.

The operational success met by the first series of international operators has triggered large transport and industrial companies' decisions to enter the market, and new operators are now coming on stream, most often starting from a domestic base and expanding activities in their region of origin. Some of these operators may well soon enough reach a stage where they will compete with the first set of international players in world markets, which is likely to help maintain a sound level of competition, in the face of the possible emergence of some situations of regional dominant position.

Ⅲ. The Port of Singapore's Strategy

3.1 Strategy for Global Network and Partnership with Neighbouring Ports

One of the recent trend for the 21st century hub port is the emergence of multi-port operating companies which can provide standard facilities with common operating and administrative services. The Port of Singapore Authority (PSA) has secured participation in nine port projects peppering the coasts of Brunei, China, Italy, India, Korea, Portugal and the Middle East, since setting up its International Business Division in May 1996. In 1999, the world's largest transshipment operator handled almost 1.72 million TEUs outside Singapore. Its target will stretch towards handling at least 10 million TEUs outside of Singapore by year 2007, and it will earn at least a third of its revenue from overseas projects. The port of Singapore enabled to save large

4) Altogether these 5 major terminal operators today hold more than 25% of the world port container handling market, with HPH and PSA Corp. topping the list with close to 10% each. UNCTAD (1999), Ports Newsletter No.19

amount of money through the multi-port operating strategy by the pooling of information technology, and sales and marketing functions. The specific character of PSA's foreign direct investment could be the investment in the joint venture style with shipping companies which have cargo to secure minimum throughput volume for newly developed port.

Partnership with ports in neighbouring countries is a long term strategy which the PSA is adopting[5]. Instead of competing head-on with neighbourning ports, it makes better long term sense to co-operate with each other. The aim is to help each other develop into efficient ports so that the regional attractiveness for trade maybe improved. Any partnership should be working towards a win-win situation. In the long term as a result of better infrastructure, efficient operation and good management, both PSA and the ports in partnership with it can gain because of increased trade volume in the region. PSA has already moved into a strategy of what is known as regionalization. The underlying idea is always to assist others to move upwards, a win-win situation, and not downwards, a win-lose situation. The philosophy is simple. If PSA gains at the expense of other ports the support such ports give to feeder services (the spokes leg) would be adversely affected. It may then not be cost effective for shippers and main line operators to operate the hub and spokes arrangement in the region who may then choose to move out. The position of PSA is clear, in the long term interest of PSA to see that the regional ports do well because the region as a whole would benefit, and so would PSA.

> "Our goal is to bring PSA's considerable experience and expertise in port management and operations to partners around the world to build world-class transportation and logistics hubs, and to extend our services to meet customers' needs outside of Singapore." [6]

3.2 Partnership with Shipping Companies and Customers

A recent initiative by the PSA to enhance its position as the regions main transhipment hub is to draw up long term service contracts with shipping companies. Such contracts called the virtual terminal agreement allow the shipping lines to share with PSA the gains from better cost control, reliability, and operational flexibility of terminal management[7]. Shipping lines will enjoy greater price stability given the long term mature of the contract. So far, PSA has signed with the global shipping consortium of American President Lines, Nedlloyd Lines, Mitsui OSK Lines and Orient Overseas Container Line. Under the partnership contract, PSA provide a team of PSA managers, ship planners and yard planners dedicated exclusively to servicing the terminals they use. This expected to cut cost over time through faster loading and unloading of cargo, as the workers become more familiar with the shipping lines operational procedures.

To foster stronger partnerships with its customers, PSA formed an International Advisory Council (IAC). The IAC provided a forum through which views and feedbacks are made on trends

5) Lee, T.S (1995). Singpore well connected to Asia's hubs. Portview. PSA. Feburary.
6) Mr Goon Kok Loon, Deputy Group President (International)/President (International Business Division), PSA.
7) Sim Wai Chew, (1996), PSA launches new service contract for shipping firms , The Straits Times, Singapore, 13. August.

of the industry and PSA's service levels. Chief executives of key shipping line customers invited to the IAC will advise PSA Corporation on how to increase its competitiveness and better serve its customers. The IAC is a manifestation of PSA's commitment to creating new channels for customer feedback.

3.3 Infrastructure Development

To be a hub port, adequate port facilities are essential to handle large volumes of cargo traffic, high frequencies of ship visit, and to deal with large ships. The port of Singapore has ensured that its port facilities are adequate to meet these requirements. The port of Singapore has a well-developed port infrastructure, not only in terms of the number of container berths, cranes and adequate storage facilities, but also in terms of the quality of the cranes, quality and effectiveness of the port/inter-port information systems, approach channel provided, preparedness of port management and a wide range of port-related and ship related services offered. PSA is constantly upgrading its port infrastructure to meet future demand. Singapore's latest state-of-the-art Pasir Panjang Terminal was officially opened in March 2000 to cater to the increasing container volume passing through their port. The container terminal is equipped with facilities to handle mega-container ships with ease and efficiency.[8] Table 2 compares the port of Singapore with similar ports and other ports in the region in terms of physical infrastructure.

Also, PSA aims to develop Singapore into a leading international maritime centre by leveraging on Singapore's existing strength in financial services, IT, telecommunications and transportation. Among others, PSA strives to further build up its ship registry, develop the human resource required and establish Singapore as a centre for maritime research and technology. PSA welcomes more shipping-related activities like marine insurance and ship financing as well as increased participation from financial institutions to play an active role in these sectors. PSA also continue to attract and develop the necessary talents to support the port and shipping industry in Singapore. Being a leading centre for maritime research and technology would contribute to sustaining Singapore's position as a major port and shipping center.

〈Table 2〉 Adequacy of Port Infrastructure: Comparative Study of Selected Ports

	No. of container berths	No.of container shipcalls	Delays (hours)	No.of along the shore cranes
Port of Singapore	50	24,015	2.3	115
Port of Klang	13	4,889	-	31
Port of Bangkok	20	2,415	-	-
Port of Manila	10	5,463	22.0	19
Port of Tanjung Priok	25	3,239	50.0	10
Port of Rotterdam	30	5,544	1.7	66
Port of Melbourne	12	823	8.0	16
Port of Felixstowe	13	2,677	0.6	29

Sources: Tongzon, J. (2001). Key success factors for transshipment hubs: the case of the port of Singapore. IAME Conference. Hong Kong

8) Port of Singapore (1999). The PSA Corporation Annual Report 1999.

3.4 Privitization

Shippers are constantly looking for higher standards, demanding a continuing improvement in service quality. Port privatization could be a way of increasing productivity by providing reliable and efficient service tailored to the needs of the port users. Private sector participation in port operation has reached a significant dimension over the last decade. This has been driven by broader trends within the transport sector as well as a new understanding of the general role of the public sector in the provision of infrastructure services. The countries that have led this reform process have been able to attract significant private capital investment to refurbish infrastructure assets and to modernize cargo-handling equipment. Under private management, ports have significantly improved performance with regard to service quality and reduction of handling costs. Whether these initial achievements that have been largely driven by competitive tendering of concessions can be sustained in the long term, will heavily rely on the ability of port authorities to stipulate effective intra port competition. Driven by the emergence of multimodal transport networks regional competition will gain relevance and thus the need for regional and multi modal assessments of competitive structures will require port authorities to coordinate on a broader scale.

Furthermore, increased globalization of the port, terminal and shipping industry means that new conditions of competition appear, which require governments and public port authorities to monitor the market across national boundaries. In such a context, the role of an effective public regulation of the sector will become critical to optimize the efficiency of the new partnerships developing between the public and private sectors on one hand, and between ports, terminal operators and shipping lines, on the other.

In recognition of the opportunities in the region and the need for PSA to be flexible to meet customers' requirements, the Government of Singapore estabilished PSA's corporatization. The corporatization enabled it to seize the opportunities and respond more effectively to the challenges ahead. PSA's corporatization has been achieved in several stages.

In the first stage, the Government set up the regulatory body, the MPA (The Maritime and Port Authority of Singapore), in February 1996. The conversion of PSA from a statutory board into a corporatised entity, PSA became the only terminal port operator in view of the strong competition in the transhipment port business. Being the only terminal operator in the port of Singapore, it seeks to create value for its shareholders as a corporatised entity, it must continue to play an important role in promoting and growing the port together with its customers and stakeholders, i.e. its staff, government agencies such as MPA, as well as shipping lines, shippers and the general public.

After PSA's corporatization, MPA regulated the industry with a light touch. Like a referee, MPA adopted a largely hands-off approach, so as to give PSA Corporation and its companies the independence and flexibility to run their businesses with little intervention. However, MPA's regulatory framework seek to strike a fine balance between the commercial interests of PSA Corp, and the interests of the nation and public, including the shipping and local business communities. PSA and MPA work closely together, keeping in mind their shared and common objective to keep Singapore as the leading hub port and an international maritime centre.

3.5 PSA's Port Operation System

Port privatization and computer technology are,

arguably, the two most important issues facing present day ports. The most important effect of port computerization is to reduce the dwell time which has same effect to increase port capacity. It also cuts down on the time taken for the transfer of the container from one mode of transportation to another. The net result is that the throughput capacity of the port increased proportionately to the time saved per container multiplied by the total number of containers the port handles. The port users also benefit because of more efficient and streamlined operations, with minimum time wastage. All the benefits, tangible and intangible combined, reduce the operation cost of transporting containers through the port, which is an attractive reason for shippers/shipowners to use the port. An outline of the PSA's information and computing systems is detailed in Table 3.

Ⅳ. Comparative Analysis of Port of Singapore's Strategy and Implication for Busan Port

In comparing Singapore port and Busan port, both ports are strategically located on the main marine routes. The Port of Singapore is developed as a transshipment hub as more than 80% of their container throughput is transshipment cargos. The general policy of the PSA is to make the port of Singapore into a highly efficient and competitive 'load centre' port of the region. The government sees the port as more than an income earner. The port not only earns good revenue from the port related activities, but the 'spin-offs' in terms of trade ties with neighbouring countries and the world at large, is invaluable. The port has been and is a major 'primer' for country's international trade. The spin-offs also provided jobs. In the context of Singapore, the

〈Table 3〉 Operating System of Port of Singapore

Portnet	One-stop electronic documentation system which provides a 24-hour on line service that enable port users to electronically submit declarations, plans manifests to PSA and make inquires and requests from their offices. It also facilitates document processing with all relevant authorities and trading parties for the movement of cargo through the MAINS.
MAINS (Maritime Information System)	MAINS seeks to streamline documentation flow among the shipping, forwarding and trading communities and controlling agencies by incorporating the requirements of all parties into a single database. Users need to provide the cargo and shipping details only once, reducing time and labour on data entry. The information will be stored in the MAINS database at the PSA for use by parties who need them.
Tradenet	Government-sponsored EDI system. IT facilitates the electronic submission of trade documents from freight forwarders and other members of the trading community to the various government agencies can also exchange trade information and documents electronically to expedite approvals of import/exports, port operations, cargo clearance and statistics compilation. About 70 percent of all Tradenet users are freight forwarders and the volume of declarations via Tradenet is increasing every month
Teleport	Telport establishes direct port-to-port links providing the local maritime community with advanced shipping information. It gives both PSA and the port users more lead time for just-in-time planning and operations. This enables better scheduling of vessels arrivals and departures; thus providing for a faster turn round time
Boxnet	Boxnet is a relatively new part of the EDI system which improves cargo tracking accuracy and increase gate productivity. Boxnet works by linking the port authoritys mainframe computer system with the trucks offering container haulage system service to/from the port.

CITOS (Computer Integrated Terminal Operations System)	CITOS plans and direct all aspects of container handling operations through extensive use of expert systems and on board computers in the cranes and prime moves. To do this, the CITOS ship planning expert system takes into account the quay crane workload, hydrostatic stability of the ship, next port-of-call and stacking operations at the yard. The CITOS yard planning expert system ensures easy access of containers and optimises the use of yard space.
CIMOS (Computer Integrated Marine Operations System)	CIMOS comprises the Vessel Traffic Information system (VTIS), the expert Planning Systems, the Port Traffic Management System and the Computerised Communication System. A ship coming into Singapore is immediately tracked by the radar-based computer systems of the VTIS. Monitoring its movements on a real-time mode, and forewarn the vessel, thereby enhancing safety in the busy port waters. The second phase of the VTIS is to track and monitor the movements of the vessels within the port waters. The Expert Planning System consist of a network of integrated expert systems, using the information captured by the central database of the Port Traffic Management System, go plan and coordinate the deployment of pilots, tugs and launches efficiently.

Source: PSA's annual reports, various years.

success of the port has a far greater effect in the country's economy than would many other ports to their respective countries. Unlike Singapore, 70% of the port of Busan's container throughput is import and export cargos. Korea has a more significant local market in terms of economy activity, which can provide a guaranteed source of cargos to bring about sufficient cargo base to attract large shipping lines. In this respect Busan port has more potential to become a hub port than Singapore port. In spite of the difference between Busan port and Singapore port, Singapore resembles Busan in many respect, at the same time. Port of Singapore shows competitiveness in many areas which Busan port need to benchmark. Table 4 outlines the comparison of the port of Singapore and port of Busan in general.

4.1 Roles of Singapore Government and Wide Range of Port Services

One of the key success factors that have made the Port of Singapore a successful global hub was the result of a pro-active government intervention and effective implementation of appropriate seaport policies[9]. Singapore government considered logistics activities as the key success factors of trading activities and developed logistics and information infra structure. Also, by activating port and logistics relating industries, they can reduce the logistics cost in general which attract MNCs to use Singapore as a logistics centre. The concept of a warehousing and distribution centre has been well supported by the government of Singapore, which sees this as vital as its cargo handling function to the promotion of the port as a full-fledged global hub. Also, the port of Singapore has considered distribution as an integral part of its wide-ranging port services and international distribution centre, and warehousing function was promoted intensively by Singapore' Trade Development Board in the mid 1980s. In the national context the port has been a major contributor to national income and employment. Currently, more than 500 multinational

9) Tonzon, J. (2001). Key successfactors for transshipment hub: the case of the port of Singapore. IAME Conference. Hong Kong.

〈Table 4〉 Comparison of Singapore port to Busan port

	Port of Singapore			Port of Busan		
Characteristic of shipping network	Connecting Pacific rim and Europe/ Africa			Hub port on the main trunk route of the pacific		
Characteristic of port	○ Tranquility Water ○ 80% of cargo throughput are trans-shipment cargo			○ Tranquility Water ○ 70% of cargo throughput are impiort and export cargo		
Port facility	○ 4 container terminals and 34 container berths. Developing Pasir Panjang Terminal with 49 container berths.			○ 4 container terminals and 16 container berths. Developing Busan new port with 24 container berths.		
Port competitiveness (Comparison between two ports)	○ More competitive regarding Port facility, port service, logistics environment, transshipment cargo handling charge.			○ Cheaper port logistics cost,, port facility using cost, tug and pilot charge.		
Container cargo handling	year	ranking	volume (teu)	year	ranking	volume (teu)
	1985	6	1,698,803	1985	12	1,148,000
	1998	1	15,100,000	1998	5	5,752,955
	2000	2	17,200,000	2000	3	7,230,000
Financial record	○ In 2000, port fixed assets are estimated approximately 40 billion US dollar and port sales reached 15 billion US dollar with a net profit of 4 billion US dollar.			○ In 2000, port fixed assets are estimated approximately 39 billion US dollar and port income was 1.2billion US dollar.		

Sources: Constructed by Author based on various sources

companies are using Singapore as a distribution centre. Furthermore, port of Singapore has built a wide range of ship-related and port-related services such as bunkering, ship repair, storage and others. Also, they provide marine finance, insurance, brokerage, and others to create a one-time-stop port and logistics related services.

Last year, the container throughput in port of Busan was 7.54 million TEU, ranking the third in the world after Hong Kong and Singapore. However, the port of Busan has no dedicated area for logistics centre in its hinterland which can generate many value added activities such as storage, transshipment, framing, processing. In addition, according to the Busan city's survey, currently, there are only 1,699 port logistics companies in Busan city and 82.3% of them are small companies hiring less than 20 employees and there is no multinational company using Busan as a logistics centre. In the 21st century hub port competition is in large extention a value added logistics service competition. If the ports only act as a node between sea and land transportation, they will lose the competitiveness. So, the 21st century hub port should have the ability to generate values when cargos are passing their port, and survive as a successful partners in the supply chain. Therefore, to advance the port of Busan, it is essential to strengthen its port logistics service. For this, the government should

play a critical role by adopting business-friendly and transparent polices that can attract more third-party logistics providers to set up their operations in Busan. Like Singapore's case, Busan port also can be the major contributor to the national economy and employment.

4.2 Marketing Strategy for Transshipment Cargos

To enhance its position as the regional transshipment hub, the port of Singapore provides the long-term contracts with shipping companies, which allow the shipping companies a better cost control, reliability, and operational flexibility[10]. Through the long-term contract, shipping lines can enjoy the greater price stability given by the long-term nature of the contract, and PSA provide a team dedicated exclusively to serving the long term contractor who has higher volumes. This is expected to cut cost over time through faster loading and unloading of cargo, as the workers become more familiar with the shipping lines' operational procedures. Long term contracts are also enable PSA to further commit resources into developing customized IT products for these customers as well as to synchronize long term infrastructure investments to meet their customers' demands. Also, in port of Singapore's case, rebates are given to customers if they are able to ship their containers out of port of Singapore within a specific period of time. This scheme encourages quick turnaround of containers and enables port of Singapore to maximize the use of its limited land space. By the active marketing to shippers and shipping companies, the port of Singapore achieved the effect of cargo concentration and enhance their competitiveness. Rebates are often used as an incentive for higher volumes, to develop new markets as well as to encourage the efficient use of resources.

Shippers and shipowners are always looking for the most cost effective way to transport containers from origin to destination. One of the most important considerations is port tariff. At present, all the Korean ports are adopting a single tariff system. So, it maybe difficult to attract port users, if not possible to use port tariff policy as a marketing tools. To stimulate a port marketing, it is necessary to have a multi-tariff policy according to each port's character. The port of Busan can consider the Dwell Time Sliding Scale System, supplying a preferable discharging tariff to early or T/S cargos. Also, under certain guarantees to give long-term customers a preferable tariff can be considered. Depending on liner companies, routes, and call frequencies, port of Busan could stimulate a variety of tariff rates, coupled with single tariff system in order to attract more customers.

4.3 Strategy for Global Network / Partnership with Neighbouring Ports

As a single independent port, the port of Singapore realized the limitation in increasing cargo throughput volume and adopted global network strategy rather than competing with its neighbouring ports. Partnership with its neighbouring ports created new marine routes and enhanced marine route's efficiency. Therefore they could reduce the logistics cost which made the port of Singapore more competitive. Their philosophy is to help neighbouring ports develop into efficient ports, so that the regional attracti-

10) Sim Wai Chew (1996). PSA launches new service contract for shipping firms. The Strait Times, Singapore, 13 August.

veness for trade is improved. If the regional ports do well, the whole region would benefit and so would the port of Singapore. As a single port, the port of Busan also has a limit in the increase of throughput volume. Furthermore, competition with domestic and foreign ports cannot guarantee constant increase of cargo. Hence establishing cooperative relationship with its neighbouring ports through global network and developing new cooperative marine route is necessary to guarantee a constant increase of cargo volume.

V. Conclusion

There is an evolving vision in the growing economies of the Asia Pacific countries to develop their ports into world-class transportation and logistics centres. A new approach is being taken on port policy and management according to the changes in international logistics and shipping environment. Ports are now more customer oriented. Many are turning towards privatization to give flexibility and quick responsiveness to market conditions. Different strategies are being used to attract shippers/shipowners to use the port. The Port of Singapore Authority (PSA) adopted strategies including partnership, infrastructure development, privatization, globalization and advanced port management and operation system to respond the changing environment, and emerged as a very successful hub port serving the South East Asian Region. Comparative studies of port of Singapore's strategy revealed that there is a current need for Busan port to develop long term strategy and efficient port management system based on PSA's experience and knowledge to respond successfully to the changing environment and to become a hub port in the North East Asian region. This should include strengthening its port logistics service to survive as a successful partners in the supply chain, partnership with shipping companies and neighbouring ports, marketing strategy for transshipment cargo, and port computerization which can reduce the dwell time. As is pointed out previously, there is a differences between Singapore port and Busan port. So it is difficult to say that all the PSA's strategy are suitable and applicable for Busan port. Nevertheless, the port of Singapore has been considered as the most competitive and successful transshipment hub in many areas. Therefore this study can be deemed as one valid opinion for identifying Busan port's potential improvement and making it a future hub in North East Asia.

References

1) Airriess, Christopher (1993). Export-oriented manufacturing and container Transport. Geography, 78 (1), pp.31-42.
2) Audrey, M. (1995). Developments at the new container terminal. Portview, PSA. February. p.10
3) Bascombe, A. (1994). Port privitization made easy. Containerization International, November, p.96
4) Branch, A.E. (1986). Element of Port Operation and Management. London. Hutchinson & Co.
5) Comtois, Claude (1994). The evolution of containerization in East Asia. Maritime Policy and Management, 21 (3), pp.195-205.
6) Cooper, J., M. Browne and M. Peters (1992). European Logistics-Markets, Management and Strategy. Oxford: Blackwell Publishers.
7) Economic and Social Commission for Asia and the Pacific (ESCAP,1997), Intra-Regional

Container Shipping Study. Prospects for Container Shipping and Port Development. New York: United Nations.

8) Fleming, D. and Y. Hayuth (1994). Spatial characteristics of transportation hubs: centrality and intermediacy. Journal of Transport Geography, 2 (1), pp.3-18.
9) Fleming, D.K. (1997). World container port rankings. Maritime Policy and Management, 24 (2), pp.175-181.
10) Fossy, J. (1995). Hub of the matter. Containerizational International, September, p.80
11) Gardiner, R.J & Couper, A. (1992) The Shipping Revolution. London. Conway Maritime Press.
12) Hung, N.S. (1995). Towards higher productivity and better service Through CITOS. Portview, PSA. March.
13) International Association of Ports and Harbours (IAPH) (1996). The future role of ports in combined transport and distribution centre. IAPH Head Office, Tokyo, October.
14) Internet, "http://www.Singaport.gov.sg"
15) John, F. (1995). Singapore shift. Containerizational International. October. p.79
16) Lee, T.S (1995). Singpore well connected to Asia's hubs. Portview. PSA. Feburary.
17) Lim, D. (1996). Global Ports of the 21st Century. SingaPort96 and SibCon96 Conferences, Singapore.
18) Port of Singapore (1999). The PSA Corporation Annual Report 1999.
19) Port privitisation conference 1994, London. by Port Development International. November. p.41
20) Sim Wai Chew (1996). PSA launches new service contract for shipping firms. The Strait Times, Singapore, 13 August.
21) Singapore Economic Development Board (2000). SEDB Annual Report 2000.
22) Slack, B., C. Comtois and G. Sletmo (1996). Shipping lines as agents of change in the port industry. Maritime Policy and Management, 23 (3), pp.289-300.
23) The Straits Times, Changi Airport and PSA are tops in region, 15 March 1999, p.57.
24) The Straits Times, Portnet has the edge in technology, 21 November 2000, p.14.
25) The New Straits Times, The Economics of Port Klang, 21 July 1998.
26) Tongzon, J. and S. Ganesalingam (1994). Evaluation of ASEAN port performance and efficiency. Asian Economic Journal, 8 (3), pp.317-330.
27) Tongzon, J. (1995). Systematizing international benchmarking for ports. Maritime Policy and Management, 22 (2), pp.171-177.
28) Tongzon, J. (1999). Measuring Port Efficiency: An Application of Data Envelopment Analysis. Paper presented at the Taipei Conference on Efficiency and Productivity Growth, 30-31 July 1999, Taiwan.
29) Tongzon, J. (2001). Key success factors for transshipment hubs: the case of the port of Singapore. IAME Conference. Hong Kong
30) UNCTAD (1992). Strategic Planning for Port Authorities. United Nations.
31) UNCTAD (1996). Port Organization and Management. United Nations.
32) UNCTAD (1999). Port Newsletter. United Nations
33) Vantroyen, T. (1996). Setting a Brisk pace. Lloyds List Maritime Asia. June. p.16