

Some Considerations for a Regional Hub Port in Northeast Asia : with Particular Reference to Korea

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Abstract : For a nearly decade Busan has been the pre-dominant force in Northeast Asian port community, but during the last couple of years, several competitors have looked to directly challenge Busan's regional dominance, most notably, northern Chinese ports. Faced with this challenging and formidable trend, Busan has had to respond appropriately to ensure that Busan remains a regional hub well into the 21st century. The aim of this paper is to make some considerations for a regional hub container port in Northeast Asia in response to changes in the shipping industry with particular reference to Korea.

Key words : regional hub port, Northeast Asia, port competition, container cargo, transshipment cargo, O-D analysis

1. Introduction

The aim of this paper is to make some considerations for a regional hub container port in Northeast Asia in response to changes in the shipping industry with particular reference to Korea.

Containerised cargoes in Northeast Asia region have increased rapidly in recent years. The amount of the traffic in the region was 75.1 million TEU in 2001, representing 30.6% of the world's containerised cargoes (245.8mTEU). In particular, about 15 million TEU were transshipment cargoes (T/S cargoes) that occupied about 20% of the total due to a large increase in T/S traffic in relation to China.

Korea is forging ahead with significant port investment to ensure the country has a chance of becoming a logistics hub for Northeast Asia amid huge competition from China. The state will invest 61.7trn Won(\$290bn) until 2020 in Busan, the country's largest port. Completion of Busan New Port Project will be speeded and finished by 2006, not 2008 as originally planned, as the cramped existing facilities were running at the limit of their design capacity. Six berths will be added. On top of this, the Korean government has a plan to develop Gwangyang as a Northeast Asian logistics hub and it will have another eight container berths by 2006 and there will be a total of 33 by 2011. Having said that, Korea's ambition to be a logistics and transshipment hub looks sound, as it is sandwiched between the economic powerhouses Japan and China.

However, port development in Asia, boasting the world's top six(6) container ports, has taken a new, even more competitive turn in the last few years, particularly in

Northeast Asia region. Having enjoyed the position as a transshipment port for the Northeast region of China, Korea has come under threat from bold Chinese port development projects, notably Shanghai, as northern Chinese regional ports including Dalian, Tianjin, and Qingdao place more emphasis on building facilities capable of handling growing trade volumes. Undoubtedly this would lead to a decline in transshipment container traffic moved via Korea.

It is anticipated that Chinese ports will increase their direct service over time through infrastructure improvements and that the percentage of Chinese cargo transshipped through non-Chinese ports will decrease. Already, a number of the major vessel services have direct calls to northern Chinese ports.

2. Growth of Containerisation in Northeast Asia

Boosted by continued strong growth in China, the economies in the Northeast Asia region are predicted to expand by 6.2% in 2004, up on last year's 6%.¹⁾ The fast pace of China's economic growth has spurred a sharp increase in the containerised traffic in the region.

The amount of the traffic in the Northeast Asia was 75.1 million TEU in 2001, representing 30.6% of the world's containerised cargoes (245.8mTEU). In particular, about 15 m TEU were transshipment (T/S), cargoes that occupied about 20% of the total due to a large increase in T/S traffic in relation to China.

Further, during 2002, China's top 10 container ports recorded an impressive 35 % increase in traffic to 30.3 m

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TEU. Shanghai recorded 8.61 mTEU, for the first time overtaking Kaohsiung, which recorded 8.49 mTEU. In 2003, 40.2 mTEU were dealt with in 10 major Chinese ports with a growth of 33% among which 5 major Chinese ports including Shanghai, Qingdao, Tianjin, Ningbo, and Dalian have handled more than 23 mTEU as shown in Table 1.

Table 1 Container cargoes handled in 10 major Chinese ports(2003)

(unit : mTEU)

	Shanghai	Shenzen	Qingdao	Tianjin	Ningbo
A	11.3	10.6	4.2	3.0	2.8
B(%)	31	39.3	24.3	25	48.8
	Guangzhou	Xiamen	Dalian	Zhongshan	Jiangmen
A	2.8	2.3	1.7	0.75	0.74
B(%)	27.1	32.9	23.6	17.5	53.3

A : Container cargoes handled,

B : Increase rate compared to the previous year

Data : Korea Maritime Institute

According to World Container port traffic league in 2003, 8 ports in the Northeast Asia region were also included in top 30 container ports including Shanghai(3rd), Busan(5th), Kaohsiung(6th), Qingdao(14th), Tokyo(17th), Tianjin(21st), Ningbo(24th) and Yokohama(28th)²⁾ as indicated in Table 2.

Table 2 World top 30 container ports in 2003

(unit : TEU)

Rank	2002	Port	2003	2002	Growth Rate(%)	▲/▼
1	(1)	Hong Kong	20,100,000	19,140,000	5.0	960,000
2	(2)	Singapore	18,100,000	16,800,000	7.7	1,300,000
3	(4)	Shanghai	11,280,000	8,610,000	31.0	2,670,000
4	(6)	Shenzen	10,610,000	7,613,754	39.4	2,996,246
5	(3)	Busan	10,366,881	9,453,356	9.7	913,525
6	(5)	Kaohsiung	8,840,000	8,493,000	4.1	347,000
7	(8)	LA	7,180,000	6,105,863	17.6	1,074,137
8	(7)	Rotterdam	7,100,000	6,515,449	9.0	584,551
9	(9)	Hamburg	6,138,000	5,373,999	14.2	764,001
10	(10)	Antwerp	5,445,437	4,777,387	14.0	668,050
11	(13)	Dubai	5,151,955	4,194,264	22.8	957,691
12	(11)	Port Klang	4,800,000	4,533,212	5.9	266,788
13	(12)	LB	4,658,124	4,526,365	2.9	131,759
14	(15)	Qingdao	4,240,000	6,410,000	24.3	830,000
15	(14)	NY/NJ	4,145,000	3,749,014	10.6	395,986
16	(20)	Tanjong Pelepas	3,487,320	2,660,000	31.1	827,320
17	(19)	Tokyo	3,280,000	2,712,348	20.9	567,652
18	(16)	Bremerhaven	3,190,707	3,031,587	5.2	159,120
19	(21)	Laem Chabang	3,180,130	2,656,651	19.7	523,479
20	(17)	Gioia Tauro	3,146,662	2,954,571	6.6	194,091
21	(23)	Tianjin	3,000,000	2,410,000	24.5	590,000
22	(26)	Guangzhou	2,770,000	2,180,000	27.1	590,000
23	n/a	Tanjung Priok	2,757,513	n/a	n/a	n/a
24	(31)	Ningbo	2,750,000	1,860,000	47.8	890,000
25	(18)	Felixstow	2,700,000	2,750,000	1.8	-50,000
26	(22)	Manila	2,552,187	2,462,169	3.7	90,018
27	(25)	Algeciras	2,515,908	2,229,141	12.9	286,767
28	(24)	Yokohama	2,466,555	2,364,516	4.4	104,039
29	(35)	Xiamen	2,331,000	1,750,000	33.2	581,000
30	(28)	Jawaharial Nehru	2,174,098	1,850,352	17.5	323,746

Data: Containerisation International, 2004. 3.

3. Shipping line strategies and their Impact on container ports : Hub and spoke service pattern strategies

With the ever-changing container shipping, shipping lines have been pursuing strategies in the global market place to try to remain competitive and profitable. To maintain their profitability, shipping lines are seeking several strategies including consolidation, rationalisation, supply chain integration, differentiation aimed at niche markets, and reducing costs.

Structural reorganisation has been made by concentration and rationalisation through mergers and acquisitions. Further the deployment of bigger vessels and transshipment strategies have been adopted in order to achieve greater operational coverage and economies of scale.³⁾

The liner shipping industry, for example, is trying to concentrate and rationalise to achieve economies of scale. Simply put, savings can be made by handling large amounts of cargo on bigger and larger ships, if port time does not increase. However, no single line has enough market share or enough ships to meet the sailing frequency shippers require and fill its vessels. To offer frequent services and consolidate cargo so that vessels sail at an acceptable capacity, lines combine into groups or consortia. To gain more overall control, shipping lines look to increase market share by acquiring other shipping lines or merging. This also spreads shipping line's interests over many different shipping routes and reduces its exposure to risk.

Equally as important, alliances are also a method of protecting freight rates. Alliances are a way for container shipping companies to aggregate cargo volumes, increase service frequencies, improve asset utilisation through the sharing of vessels, terminals, equipment and containers, and employ their collective financial strength for long-term asset procurement and replacement. Alliances are a double edged sword for the shipping industry: on the one hand they allow lines to achieve the benefits listed above, but on the other they send out a very strong signal to shippers that there is very little difference between shipping lines and make competition on the basis of anything other than price more difficult.

Table 3 Capacity share for the trans-Pacific trade (%)

Operator	2002	2001
New World Alliance(HMM,MOL,APL)	18.1	17.4
COSCO/K Line/Yangming	16.2	14.2
Grand Alliance(Hapag-Lloyd,MISC,NYK,OOCL,P&O Nedlloyd)	13.9	15.3
Evergreen/Lloyd Triestino	12.3	9.0
United Alliance(Hanjin,DSR Senator Lines, UASC)	11.5	12.4
Maersk/Sealand	9.5	11.5
Total	81.5	79.8

Source : UNCTAD, Review of Maritime Transport 2003, 2004.

The market share of alliances has grown over the past years, and the increasing importance of alliances is one of the elements contributing to concentration in the shipping industry.

The combined share of the six major groupings of operators increased by almost 2 percent, as indicated in Table 3, although there were large percentage fluctuations for individual operators.

Shipping lines are making increasing use of transshipment to offer global services and increased service frequency. Transshipment is the movement of containers to main hub ports or ports handling transshipment cargo and the subsequent transfer of the cargo to a feeder or direct call vessel. Transshipment covers the less frequently referred to patterns of 'relaying' and 'cross feeding'.

The main factor for a shipping line when selecting a hub port with respect to the main axial East/West trades and either hinterland or feeder connections are location. For effective global operations it is essential that the feeder/hinterland services on the North-South routes is integrated with the East-West axial trades. To ensure that this happens, most of the larger carriers operate their own feeder services, have access to partners' networks or establish long-term contracts with third party feeder service providers.⁴⁾

More and more shipping lines are investing in larger vessels that will be employed on the main trade routes in transshipment strategies. Transshipment itself, therefore, is set to grow considerably in the future.

perspective the current order book represents 38% of the capacity of the existing container fleet.

Heavy ordering of post-Panamax vessels was evident throughout 2003, with 227 ships on order over 5,000TEU capacity.(Table 4) This represented 37% of the total orders as of Oct. 2003. Many of the major ocean carriers have opted for 7,500-8,500TEU 'super' post-Panamax ships, and over 100 of these vessels are currently on order. When they are eventually delivered between now and 2007 the will provide the staple tonnage for the trans-Pacific and Asia/Europe trades. These mega ships are likely to replace vessels of 5,500 to 6,500TEU.⁵⁾

4. An Analysis on the Distribution of Transshipment Container Cargoes in Northeast Asia : with particular reference to Korea and China⁶⁾

Containerised cargoes in Northeast Asia region have increased rapidly in recent years. The amount of the traffic in the region was 54.7 m TEU in 2000, representing 27% of the world's containerised cargoes. In 2000, Port of Busan handled 7.54 m TEU of which 2.39 m TEU were transshipment cargoes (T/S cargoes), mainly due to a large increase in T/S traffic in relation to China. T/S containers handled in Busan port in 2000 increased at a rate of 25.1%, which was much bigger than that of 11.3% of total containers. This was mainly because of the lack of port facilities in China and partly because of shallow water depths and geographical location of Northern Chinese ports, resulting in deviations from the regional trunk route.

The evolution of super post-Panamax container ships and the large-scale integration of mainline container shipping companies, as well as their increasing participation in global logistics chain activities, puts an emphasis on the demand for effective strategic transshipment, particularly to those ports which would like to take a position of hub in the region.

The purpose of transshipping cargo is not only to reduce the total cost of collecting and/or distributing containers carried by a mega-mainline container vessel a variety of origin and destination ports, each of which only contributes a part of the mainline vessel cargo, but also to improve just-in-time delivery of cargo, reduce in transit inventory, and make the total origin-to-destination movement of containerised cargo more seamless. In particular, one of the many advantages of T/S containers is an opportunity for cargo consolidation or deconsolidation and value-added activities which resulted in about US\$200 per TEU.⁷⁾ In this section, an Origin-Destination(O-D) analysis between

Table 4 Summary of world containership fleet in service and on order by shiptype and size(Oct. 2003)

Ship type	Under 1,000	1,000-1,999	2,000-2,999	3,000-3,999	4,000-4,999	5,000-5,999	6,000-6,999	7,000 plus	Total
Fully Cellular									
Present Slots	497,130	1,244,077	1,341,917	934,910	998,883	778,486	638,461	461,130	6,438,078
Present Ships	989	911	400	270	221	141	98	6	3,136
Slots on order	48,218	94,424	241,928	85,400	391,183	447,741	231,932	873,226	2,423,346
Ships on order	76	66	33	27	90	84	31	108	380
RO-RO									
Present Slots	270,719	89,698	38,444	0	0	0	0	0	388,861
Present Ships	898	69	13	0	0	0	0	0	980
Slots on order	7,000	0	0	0	0	0	0	0	7,000
Ships on order	8	0	0	0	0	0	0	0	8
Non Cellular									
Present Slots	1,033,447	441,872	732,284	0	0	0	0	0	1,482,603
Present Ships	3,033	335	16	0	0	0	0	0	3,484
Slots on order	1,183	14,978	1,042	0	0	0	0	0	35,233
Ships on order	9	8	7	0	0	0	0	0	24
Totals									
Present Slots	1,811,296	1,879,647	1,343,633	934,910	998,883	778,486	638,461	461,130	8,319,500
Present Ships	4,890	1,346	431	270	221	141	98	6	7,463
Slots on order	70,491	109,402	243,070	85,400	391,183	447,741	231,932	873,226	2,467,349
Ships on order	95	74	101	27	90	84	31	108	613

* Includes Bulk container, Semi container, Multi purpose and Lash/Barges

Containership ordering has reached an all time high. As of Oct. 2003, the global order book stood at 610 container ships giving a total TEU capacity of 2.4 m TEU. Some 330 ships have been ordered in 2003, with a combined aggregate capacity exceeding 1.7 m TEU. To put this in

major Korean seaports and top 20 Chinese ports was done.

1) Data collection

Data for making an O-D analysis for container cargoes between Korea and China were available through shipping companies, terminal operating companies, customs service office, KT-Net, Port-MIS, and etc. Accuracy of data from each source was very much dependent upon the extent to which data were available and how they were counted. In this paper, as far as the availability and the usefulness of data collection are concerned, those data from shipping companies and KT-Net data were most appropriate. By carrying out pre-feasibility study for the usefulness of data, shipping lines' data based upon B/L were mostly accurate and very easy to collect and analyse.

Further, it was confirmed that KT-Net has provided a database for container cargoes by export, import, and T/S; loading port, discharging port, T/S port, customs office in the region, cargo specification, weight by container, and etc. Based upon the results of the pre-feasibility study, 3.5 million items were taken for preparing O-D analysis and T/S data of container cargoes between Korea and China. An analysis for export cargoes from Korea to China was made from 1,163,592 B/L cases for export cargoes and 2,452,615 B/L items for import.

Table 5 Classification of container flow pattern between Korea and China

	Classification
Inbound Cargoes	Direct Export Cargoes from Korea to China
	Through Cargoes for China transshipped in Korea
Outbound Cargoes	Direct Import Cargoes from China to Korea
	Chinese Cargoes for Third Countries transshipped in Korea

2) Data analysis method

For an efficient analysis of origin and destination container flow pattern to/from Korea and China are classified into four types: Direct Export from Korea to China, Direct Import from China to Korea, Through Cargoes for China transshipped in Korea, and Chinese Cargoes for Third Countries transshipped in Korea. According to this classification, an O-D analysis was made in terms of throughput between Korea and China, container handling performance in Chinese ports. While ports for this analysis were Busan, Incheon, Gwangyang in Korea, those in China were top 20 ports.

3) O-D analysis by ports between Korea and China

(1) Container handling statistics to/from China

As shown in Table 6, total container flow between Korea

and China was 1,786,788TEU for export, import, and T/S in 2000.

Containers outflow from Korea to China, including T/S cargoes, were 756,915TEU, and containers inflow from China to Korea 1,029,873TEU. Exported containers from Korea to China were 569,122TEU, and imported containers were 393,291TEU from China to Korea. Cargoes for China transshipped in Korea were 187,793TEU while cargoes for third countries through Korea 636,582TEU which represented about 3.4 times of the former. It is known that most of T/S containers to/from China were cargoes to the third countries via Korea.

Table 6 Container flow between Korea and China(2000)

	Classification	TEU
Inbound Cargoes To China	Direct Export Cargoes from Korea to China	569,122
	Foreign Cargoes for China transshipped in Korea	187,793
Outbound Cargoes From China	Direct Import Cargoes from China to Korea	393,291
	Chinese Cargoes for Third Countries through Korea	636,582
Total	Total Inbound Cargoes from China	756,915
	Total Outbound Cargoes to China	1,029,873
	Total	1,786,788

Table 7 Container handling performance by top 20 major ports in China(2000)

Rank	Direct Export form Korea to China			Direct Import form China to Korea		
	Port	TEU	%	Port	TEU	%
1	Shanghai	148,457	26.1	Qingdao	103,970	26.4
2	Qingdao	113,876	20.0	Shanghai	79,677	20.3
3	Tianjin	66,921	11.8	Tianjin	54,358	13.8
4	Dalian	52,633	9.2	Dalian	41,905	10.7
5	Shenzhen	17,446	3.1	Xiamen	11,600	2.9
6	Xiamen	12,913	2.3	Lianyungang	8,243	2.1
7	Ningbo	11,031	1.0	Yantai	7,627	1.9
8	Lianyungang	7,222	1.3	Ningbo	7,388	1.9
9	Yantai	6,066	1.1	Nantong	4,097	1.0
10	Nanjing	5,765	1.0	Shenzen	3,698	0.9
11	Fuzhou	4,632	0.8	Shangjiagang	3,633	0.9
12	Zhangjiagang	2,524	0.4	Nanjing	2,914	0.7
13	Shantou	1,852	0.3	Yingkou	1,746	0.4
14	Taiping	1,272	0.2	Shantou	1,189	0.3
15	Nantong	934	0.1	Fuzhou	1,001	0.3
16	Zhongshan	808	0.1	Zhuhai	66	0.0
17	Yingkou	758	0.1	Zhongshan	14	0.0
18	Zhuhai	155	0.0	Guangzhou	0	0.0
19	Quanzhou	79	0.0	Quanzhou	0	0.0
20	Guangzhou	56	0.0	Taiping	0	0.0
	etc.	113,724	20.0	etc.	60,164	15.3
	Total	569,122	100.0	Total	393,291	100.0

(2) Containers throughput by ports in China

As shown in Table 7, Shanghai captured more than a quarter of a direct export from Korea to China, with 148,457TEU, whereas Qingdao represented more than a quarter of direct import cargoes from China to Korea. In terms of both direct export and import cargoes to/from Korea, four major Chinese ports (Shanghai, Qingdao, Tianjin, and Dalian) were dealing with around 68.8% of the total containers moved to/from Korea.

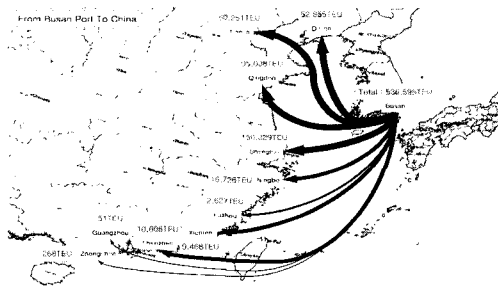


Fig. 1 Container O-D analysis between Busan and 10 major Chinese ports(2000)

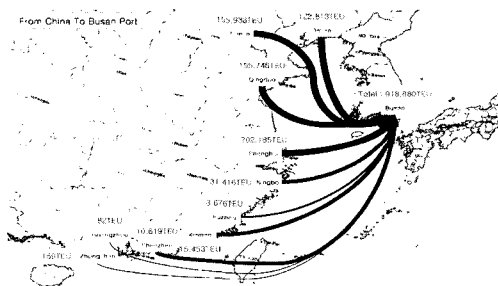


Fig. 2 Container O-D analysis between 10 major Chinese ports and Busan

Table 8 T/S Throughput by 20 major ports in China

Rank	Foreign cargoes for China transhipped in Korea			Chinese Cargoes for Third Countries through Korea		
	Port	TEU	%	Port	TEU	%
1	Shanghai	48,243	25.7	Shanghai	136,086	21.4
2	Dalian	23,849	12.7	Qingdao	122,497	19.2
3	Qingdao	23,773	12.7	Tianjin	122,494	19.2
4	Tianjin	23,082	12.3	Dalian	92,300	14.5
5	Ningbo	9,838	5.2	Ningbo	24,918	3.9
6	Shenzhen	2,307	1.2	Shenzhen	7,607	1.2
7	Xiamen	2,185	1.2	Nanjing	4,957	0.8
8	Yantai	2,144	1.1	Xiamen	4,840	0.8
9	Lianyungang	1,630	0.9	Fuzhou	2,747	0.4
10	NanJing	1,409	0.8	Lianyungang	2,551	0.4
11	Zhangjiagang	1,023	0.5	Yantai	2,486	0.4
12	Fuzhou	752	0.4	Zhangjiagang	1,991	0.3
13	Nantong	526	0.3	Shantou	1,865	0.4
14	Yingkou	288	0.2	Nantong	1,666	0.3
15	Shantou	237	0.1	Zhongsan	146	0.0
16	Zhuhai	137	0.1	Zhuhai	103	0.0
17	Taiping	99	0.1	Guangzhou	80	0.0
18	Zhongsan	20	0.0	Yingkou	64	0.0
19	Guangzhou	3	0.0	Quanzhou	2	0.0
20	Quanzhou	0	0.0	Taiping	1	0.0
	etc.	46,251	24.6	etc.	107,181	16.8
	Total	187,793	100.0	Total	636,582	100.0

(3) T/S Containers Throughput by 20 Ports in China

As indicated in Table 8, Shanghai handled a quarter of foreign cargoes for China transhipped in Korea and at the same time handled 21.4%(136,086TEU) of the total Chinese cargoes for third countries through Korea.

Table 8 illustrates that top five ports (Shanghai, Qingdao, Tianjin, Dalian, and Ningbo) are dealing with 76% of the whole T/S containers cargoes. It was found, therefore, that most Korean T/S cargoes to China were bound for the northern part of China.

(4) Implications for Korean seaports

In 2000 container cargo volumes transported between Korea and China were 1.78 million TEU and among them value-added T/S cargoes were 0.82 million TEU. In particular, cargoes for China transhipped in Korea were 187,793TEU, while cargoes for third countries through Korea 636,582TEU represented about 3.4 times of the former. As more than 90% of the transshipment cargoes were handled in Port of Busan, it can be assumed that Busan has the potential to become a regional hub port. In addition, from the pattern of transshipment cargoes most O-D ports in China are located northern part of Ningbo port, including Shanghai, Qingdao, Tianjin, and Dalian.

5. Developments of Chinese ports in Northeast Asia

As illustrated in Table 9, containerised cargoes in Busan, Korea's largest port, have increased rapidly in the last decade with the increasing rate of average 13.0%. In particular, the proportion of transshipment cargoes to total containers has increased greatly in the last five years at an average growth rate of nearly 30%, mainly due to a large increase in T/S traffic volume in relation to China. The 41.1% T/S ratio of the total containers in Busan in 2002 marked the best record by its highest margin. The strength of this development suggests that Busan has played a key role for regional shipping as a logistics hub.

However, in 2003, the increase rate of T/S cargo throughput in Busan has declined for the first time with the increasing rate of 9.4% as shown in Table 10, though the year of Busan's best performance in 2002 was also its highest level of transshipment occupying a 41% share. This was mainly because of the Chinese port development and partly because of the change of shipping line's service pattern - a direct shipping link to Chinese ports in Northeast Asia rather than a feeder link based upon so-called 'hub and spoke service pattern'.

Table 9 Breakdown of containerised cargoes in Busan

(unit : TEU)

Year	Total	Import	Export	T/S	Domestic
1993	3,115,891	1,257,598	1,533,214	263,315	61,764
1994	3,878,208	1,537,130	1,694,427	594,008	52,643
1995	4,562,387	1,749,880	1,893,418	859,298	59,791
1996	4,843,981	1,838,164	1,980,991	941,351	83,475
1997	5,332,744	1,992,846	2,136,207	1,104,827	98,864
1998	5,891,168	2,153,775	2,385,316	1,213,864	138,213
1999	6,439,589	2,271,997	2,406,194	1,632,473	128,925
2000	7,540,387	2,483,753	2,551,162	2,389,956	115,516
2001	8,072,814	2,496,764	2,513,877	2,942,983	119,190
2002	9,453,356	2,729,332	2,792,399	3,887,457	44,168
2003	10,407,809	3,029,020	3,005,983	4,251,076	121,730

Data : PORT-MIS, Busan Port Authority(BPA).

The rapid growth of the Chinese ports and the chase by the encircling ports at full speed pose serious challenges to the status of the Korean ports. Last year, such Chinese ports as Shanghai and Shenzhen took the third and fourth place respectively in the world in terms of container throughput, pushing away Busan on the basis of their country's high economic growth rate of 9.1%.

Table 10 The increase rate of T/S cargoes in Busan
(unit: TEU)

		2000	2001		2002		2003	
Total		7,540,387	8,072,814		9,453,356		10,407,809	
Foreign Cargo	Sum	7,424,871	7,953,624		9,409,188		10,245,403	
	Import	2,483,753	2,496,764		2,729,332		3,029,020	
	Export	2,551,162	2,513,877		2,792,399		3,005,983	
	T/S	2,389,956	2,942,983	23.1%	3,887,457	32.1%	4,251,076	9.4%
Domestic cargo		115,516	119,190		44,168		121,478	

While many ports tend to slow their growth as they build up a low base, at least for the past 5 years, Qingdao's numbers are accelerating. The 25% growth in 2001 was some way ahead of the 20% total growth for China's top 10 ports, while the 36% growth in 2000 was likewise ahead of the overall 32% growth for that year. Qingdao clambered up into the top 15 in 2003 with 24.3% growth to 4.2 m TEU. The development of the new Qianwan port project has been an essential part of the plan by the municipal government and Qingdao Port Authority to cope with the spectacular growth of cargo through Qingdao. This development has resulted in the direct calling service of major shipping lines into Qingdao.⁸⁾ With the adoption of Phase III development project, Qingdao will become one of the pre-eminent ports in Northeast Asia.

Situated at the west of Bohai Bay, the port of Tianjin is consumed in a struggle for volumes with local rivals Dalian and Qingdao. But it is its massively influential hinterland that will ensure that it grows both as a strategic and commercial priority. Beyond Beijing, Tianjin also looks to inland countries such as Mongolia and Kazakhstan for transshipment volumes. The local government has announced huge capital intensive plans to expand the port. Having successfully negotiated the 3 m TEU mark in 2003, Tianjin has revealed plans aimed at cracking 10 m TEU by 2010. If this plan will be successful, Tianjin will become an international container centre in Northeast Asia, the ultimate port in northern China, the centre port for international logistics and resource allocation, to be listed in world top 10 container ports.

Dalian, Tianjin, and Qingdao will compete with each other for the role as the leading regional hub port in northern China as trade volumes soar on the back of the

region's expanding economy. There is now enough volume - five or six ship calls a week, loading or unloading 600 to 800 TEU each time - for Dalian, Tianjin or Qingdao to be called a regional hub port. The creation of a hub port would attract more mainline operators. As a result, this has led to a decline in transshipment container traffic moved via Korea. Further with the shift to direct routes among Dalian, Tianjin and Qingdao and North American ports, transshipment traffic handled by facilities in Korea from northern China has been reduced, leading to lower growth or even a decrease in the transshipment cargo in Korean ports.

6. Some Considerations for a regional hub in Northeast Asia : from the Busan's perspective

South Korea is working on ambitious plans to become the logistics hub of Northeast Asia, based on expansion of the ports of Busan and Gwangyang. The Korean government will invest about \$290bn from 2004 until 2020 in Busan. Completion of the 1st Phase of the Busan New Port Development Project will be speeded and finished by 2006, not 2008 as originally planned as the cramped existing facilities were running at the limit of their design capacity. Six berths will be added. In the period to 2020, the government estimates \$15.5bn in foreign investments will arrive, which will help to create 1.52 m jobs on the port and free trade zone side. Another 24 berths will be added by 2011, allowing Busan to become an ideal vantage point for container boxes in transit from either China or Japan.

Surging container volumes through key Chinese ports over the two years, however, have taken the shine off the Northeast Asian logistics hub ambitions of Busan, the country's largest container port. Having been experiencing strong economic growth, some ports in China - particularly in northern ports including Qingdao, Tianjin and Dalian, which used to serve as either feeder ports or ports principally handling imports/exports, are responding to burgeoning transshipment opportunities through extensive investment in port development programmes, as a means of achieving main hub status within a Northeast Asia region.

For a nearly decade Busan has been the pre-dominant force in Northeast Asian port community, but during the last couple of years, several competitors have looked to directly challenge Busan's regional dominance, most notably, Qingdao, Tianjin and Dalian to the north and Shanghai and Ningbo to the south. In particular, the primary motive of the aforementioned ports in northern China has been to attract direct calls by the major carriers

while reducing dependency on feeder services out of Busan. Further port development projects in Qingdao, Tianjin and Dalian are intended as a major regional hub in their right, while also handling traffic bound for Mongolia and its beyond. With the shift to direct routes between Qingdao, Tianjin and Dalian and North American ports, transshipment traffic handled by facilities in Korea from northern China has been suffering.

Under these situations, will Busan be ready to face the challenges of the times, particularly the harsh competition from other neighbouring ports in its effort to become the leading container transshipment centre in the Northeast Asia region?

Booz-Allen has analysed the strengths, weaknesses, opportunities, and threats relevant to Busan Newport Project(BNP) as shown Table 11.

Table 11 SWOT analysis summary of BNP terminal

Strengths	Weaknesses
Large modern terminal Global operator(CSXWT) Third party operator Facility location	Lack of existing local presence/relationships High capital cost compared to publicly owned/privately operated facilities
Opportunities	Threats
Consolidate carriers/alliances into single terminal Relay cargo requiring multiple berths Premium pricing for turning assets Grow value added services Target Seoul traffic by exploiting location Leverage global pricing options	Oversupply of capacity Existing allegiances/long term contracts Chinese "mega port" development Government incentive to public facilities : uneven playing field Cultural risks with local customer base

Source : Booz-Allen-Hamilton, *Pusan Newport Market Analysis*, 2002.

An important trend that presents both serious challenges as well as opportunities for Busan is the increasing size of container vessels. Intense competition in the container shipping industry, an anticipation of strong trade growth, and the improved technology in ship manufacturing combine to make shipping lines order increasingly larger vessels. The percentage of global container vessels having capacity of at least 4,000 TEU has increased from 21% in 1998 to 38% in 2003.⁹⁾ The main reason for larger vessels is that they lower operating costs per slot. However, the lower costs will only be realised if shipping lines can fill up their gigantic vessels. This leads to a third trend in the consolidation of players in the industry, through mergers or alliances, to pool cargo to fill big ships. Lines have also discovered that such consolidation allows them a more extensive global coverage than if they were to operate alone. Hence the spate of mergers and acquisitions in recent years.

The mergers and alliances in turn introduce greater complexity in terminal operations. Now, ports have to distinguish not only container boxes shipped to and from different vessels, but also the exchange of boxes among slots within vessels operated under the same alliance.

Inter-billing of charges among lines in an alliance is also a new aspect that lines have to sort out. Ports and terminals that are able to assist shipping lines to operate flexibility in alliance arrangements, will be preferred ports of call.¹⁰⁾

Faced with this challenging and formidable trend, Busan has had to respond appropriately to ensure that Busan remains a regional hub well into the 21st century.

Busan has served a large volume of transshipment cargo in addition to a large local cargo base as indicated in Table 9. In recent years, the volume of transshipment cargo in Busan has increased dramatically - with at its peak a 46 percent increase from 1999 to 2000. This cargo is originating primarily from or is destined for northern China or Japan as illustrated in the previous section.

Busan competes with a number of large regional ports for discretionary Northeast Asia transshipment cargoes. Overall, Busan is currently well positioned to serve as a primary transshipment hub due to its relative advantage in pricing, trade lane proximity, and feeder port proximity. According to the report made by Ocean Shipping Consultants Ltd(OSC) on how much ocean carriers were being charged for terminal services at various Asian ports¹¹⁾, transshipment terminal handling costs in Busan are 47% percent less than Kobe, and 28 percent less than in Kaohsiung.¹²⁾

Similarly, Busan has an advantage over some Northeast Asian ports because of its proximity to major east-west trade lanes. Table 12 shows the diversion in nautical miles from major trade lanes for several hub ports. Except for the obvious Asia-Europe trade lane, Busan is competitively positioned for east-west trade.

Table 12 Diversion from major trade routes

(nautical miles)

	Trans-Pacific	Asia-Europe	Pendulum
Via Busan	21	1,864	16
Via Kobe	150	2,260	159
Via Shanghai	191	1,200	276
Via Kaohsiung	-	-	69

In addition, Busan is closer than its competition to many of the North Asian feeder ports such as Hakata, Dalian, Yantai, and Vladivostok. Furthermore, as far as terminal handling costs, trade lane diversion, and feeder costs are concerned, Busan is also known to be advantageous for trans-Pacific and Pendulum routes.¹³⁾

7. Conclusion

Much depends on how well Busan is able to meet those challenges and turn them into opportunities. Busan's status

as a regional hub is sustainable as long as it can continue to remain relevant and to add value to customers. Towards this end, Busan's primary focus has to work closely with customers in order to understand their needs and to continue to add value to them.

Busan's New Port Development Project is a testimony of its commitment to support the growth of its customers in the region. Unless Busan New Port is constructed as planned, the port will suffer from chronic congestion due to a lack of container terminals that, in turn, will lead to an increase in logistics costs that would probably reduce the port of Busan to the role of feeder port.

Busan also has to work with shipping lines to increase the already unparalleled container vessel connectivity in Korea. It is this connectivity that makes it worthwhile for shipping lines and regional shippers to transship containers via Busan, as Busan offers a wide choice of transit times and shipping frequencies to practically all major destinations in the world. Furthermore it has to aim to work with its customers to open up new markets in the region that will provide new sources of container growth. The new markets may be small initially but they can grow quickly once they tap successfully into a hub port like Singapore.

In addition, it has to continue to engage customers at various levels, constantly seeking feedback and inputs from them. One of such key channels for receiving feedback from customers is through the International Advisory Council, comprising a panel of the top executives of the major container shipping lines in the world, hence providing valuable perspectives on the shipping and port industry.

Transshipment hubs are almost totally at the mercy of shipping lines and can lose business over night if a new facility (particularly a dedicated one) is opened up. The 21st century will prove to be a very exciting and challenging one for container shipping lines and terminal operators alike. Busan, as a regional hub port, has to provide the advantages of high connectivity and frequency.

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- [3] *Containerisation International Yearbook 2004*.
- [4] Cargo Systems Report(1998), "Opportunities for Container Port", *Cargo Systems*.
- [5] *Containerisation International*
- [6] For the trans-Pacific, the New World Alliance has

Qingdao in the Guam China Express, which swings through Guam, Naha, then into Qingdao before calling at Busan and a handful of Japanese ports. On the Grand Alliance network, Qingdao gets visited together with Shanghai and Ningbo on the China Korea Express with a 12-day transit time to Los Angeles. CMA-CGM patronises Qingdao with the North China Express service to Europe, which also picks up cargo in Dalian and Tianjin. Evergreen has added Qingdao as a port of call in its second direct service through affiliate Lloyd Triestino. A port rotation of Shanghai, Qingdao, Busan, Hakata, Nagoya, Tacoma, Vancouver, and Shanghai is covered with five ships. Hanjin takes slots on K Line's KPS service which starts in Qingdao, then trades through Shanghai, Kobe, Nagoya, Tokyo, Long Beach, Oakland, Nagoya, and Qingdao.

- [7] For those ports that have been deselected as ports of call, resulting from the formation of Alliances/mergers and hub and spoke strategies there is often a double negative impact. Firstly, there can be a huge loss of business resulting from the loss of a particular carrier. Secondly, if it is not replaced there is resulting overcapacity that can itself prove to be costly.
- [8] Garcia, J.(2004), "Box ship order book reaches all time high", *Containerisation International Yearbook 2004*, pp.6-7.
- [9] In order to ensure that pure comparisons were, OSC examines the total cost paid by the ultimate customer. The total cost includes a basic lift rate, marshalling, and the average cost of supplementary services(e.g., overtime, hatch cover operations, re-handling charges, weighing fees). These supplementary fees can exceed 40 percent of the basic charge.
- [10] Loading and discharging charges US\$100, shuttle charges US\$35, CY handling US\$25, lashing & unlashng and check US\$17, wharfage US\$3.5.(as of Nov. 2002)
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