Container Port Competition and Co-Operation Strategies Based on Internet Plus: The Case of Rizhao and Qingdao

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Abstract

"Internet plus port" is the combination of the Internet and the virtual port industry. It will realize various aspects co-operation in production, logistics, e-commerce and management of the port. Logistics information and services will improve efficiency and bring new logistics models. Analyzing the container business of Rizhao, we made a competition and co-operation strategies based on internet plus.

Keywords: Container port; co-operation; Internet plus; Rizhao-Qingdao Container Terminal Ltd.; Strategically alliance.

"Internet plus", Internet-based and combining with Internet of Things and Mobile Internet, achieves trans boundary integration of all professions and trades so as to dig out the "long end" value in industries that has long been neglected before, realizing the innovation of product, service and mode, and building a brand new industrial ecosphere.

1. Introduction

"Internet plus" action program, first put forward in Government Work Report during the two sessions this year, escalates Internet to a strategic height that has never been to before, and as a result Internet will lead the developmental transformation of all professions and trades. For port, it is of utmost urgency how to adapt to and makes use of emerging Internet thinking to transform the traditional port industry and how to make use of "Internet plus Port" to promote the transformation of economic operating mode. "Internet Plus Port" constitutes the e-commerce linking port and logistics industry, thus remaking and reconstructing the original port service mode by transforming it into platform type from chain type, which is a flattening process.

"Internet plus Port" has two effects: first, by directly displaying the manufacturing and operating subjects inside the port on the platform, port operators are easier to perceive the changing demands of service objects such as shippers and ship-owning companies, and thus port service is more close to the market. Second, the old business model of port service paying more attention to big clients will be overturned, and the needs of small and medium-sized clients will be integrated and magnified. "Integration" here refers to small needs accumulating into big ones, and "magnification" means the port could provide small and medium clients with customized service with the aid of this platform so as to stimulate the demand of port service among them. Therefore, it is an inevitable choice to achieve transformation and upgrading that the port embraces "Internet plus", of which the essence lies in turning the port from a space node to an information service node.

2. The development of Rizhao Port container trade—a case study of the competition and co-operation of container service between Rizhao and Qingdao

2.1The development of Rizhao-Qingdao Container Terminal Ltd

In 2005, Qingdao and Rizhao had the cooperation intention on container trade, because Qingdao, facing the threat posed by Dalian and Tianjin of struggling for becoming the international center in Northeast Asia, needed to seek new development opportunities and new strategic partners, while for Rizhao, the container trade had been growing slowly over several years.

In 2007, Rizhao witnessed the container throughput of 430 thousand TEUs, Qingdao 9460 thousand TEUs, and Lianyungang 2003.1 thousand TEUs. It can be seen that located between the above two ports, Rizhao, having a low container throughput, came at the bottom of the list and thus faced tremendous pressure. In May, 2007, Qingdao and Rizhao joined to establish Rizhao-Qingdao Container Terminal Ltd., of which the cooperation form is Qingdao contributing in cash, Rizhao by asset, and both sides holding the share of 50% each. Moreover, the side of Rizhao took up the post of chairman of the board, and the side of Qingdao General Manager, that is, Qingdao was in charge of general management and had control over information. The dock of the company, situated in West Side of Shijiu Port District, in Rizhao , with its coastline length of 844 meters and two berths of 100 thousand dwt, could berth container ships of the sixth generation, which is the largest in the world. The cooperation, praised as "1+1>2", was a model of Shandong Province integrating coastal ports.

After Rizhao-Qingdao Container Terminal Ltd. came into operation, the container volume in Rizhao Port increased to some extent, but the growth rate and the scale did not meet expectations (Table 1). For co-operation, Rizhao provided many favorable terms such as promising not to operate container wharf trade and infrastructure alone with the third party and charging public utility service according to internal standards. However, concluded from the actual operating, the co-operation still did not fulfill both sides' wishes.

Table 1: Rizhao-Qingdao Container Terminal Ltd. container port throughput unit: million TEUs

year	Business objectives	throughput	year-on-year (%)	Marine direct	year-on-year (%)
2007	60-80	43	——	2.35	——
2008	90-110	70.9	97.7	5.58	137.4
2009	130-150	82.1	15.8	2.62	-60.5
2010	180-200	106	29.1	2.94	12.2
2011	annual growth rate not less than the national average after 2011	135.1	27.45	2.58	-12.24
2012		145.2	7.48	2.28	-11.63
2013		152	5.7	3.5	53.5
2014		149	-2	5.7	62.9

Source：Rizhao Port Authority offers

2012 witnessed the container throughput of 1452 thousand TEUs in Rizhao , 13308.7 thousand TEUs in Qingdao , and 4553.6 thousand TEUs in Lianyungang . The container throughput of Rizhao still lagged far behind that of Lianyungang. The throughput capacity of Rizhao, although it enjoyed good natural conditions, grew slowly as a result of backward equipment. Rizhao at once decided to increase input to promote the development of the company, but Qingdao was not positive about it. Therefore, Rizhao had no choice but to establish Guest Container Terminal Branch Company, a subsidiary of Rizhao Port Ltd., and bought four ships by itself, which were mainly engaged in routes to South Korea. 2014 saw the information-based container management of Rizhao. Currently, 95% of the container trade is domestic-oriented, and foreign trade focuses mainly on the routes to Japan and South Korea.

Qingdao Port, taking the strategic opportunity of Qingdao Port Group's transformation development, stuck to making Dongjiakou Port big. Only 30 kilometers away from Rizhao Port, Dongjiakou Port is similar to Rizhao Port on transport directions of large bulk cargoes. However, these two ports are different on the cargo kinds of containers, Qingdao Port foreign trade oriented and Rizhao Port domestic trade oriented. In December, 2014, both sides ended the cooperation for the contradiction of business division and their own interests, and Rizhao Port repurchased the 50% shareholding of Rizhao-Qingdao Container Terminal Ltd. Qingdao Port had held. The operating conditions are showed in Table 2(the taxes and profits of Rizhao-Qingdao Container Terminal Ltd. over the years). On the whole, the performance is fine, but the growth is not obvious.

Table 2: Profits and taxes of Rizhao-Qingdao Container Terminal Ltd. unit：million yuan

No	year	tax	Net profit	Growth rate
1	2007	312.17	128.72	
2	2008	-1,114.90	-1,297.54	-1108.03%
3	2009	-1,625.47	-1,066.46	-17.81%
4	2010	1,086.96	561.61	152.66%
5	2011	2,211.61	1,358.01	141.81%
6	2012	2,559.55	1,599.33	17.77%
7	2013	2,548.05	2,937.09	3.38%
Total		5,977.97	1,441.49	
8	January-September in 2014	2,194.23	4,378.58	
Total		8,172.20		

Source：Rizhao Port Authority offers

2.2The causes of Rizhao-Qingdao Container's failure

From the seven years of Rizhao-Qingdao Container Terminal Ltd., it could be seen that the competition and cooperation between ports is not necessarily achieved by making contribution of capital proportionately and setting up a community of interests and there are more factors beyond each side's control. This is mainly reflected in the following:

2.2.1Strategic positioning of a port

Qingdao Port, as a pivotal port of global ship route to some extent, was dedicated to becoming northern international shipping center, while Rizhao Port was positioned for a long time as a feeder port considering its geographical location and strength. Although the container volume of Rizhao Port was relatively small in recent years, the strength was building up, the development potential was huge, and Rizhao Port posed a big threat to Qingdao Port. Rizhao Port was active and exerted much more effort to further promote the development of container business, while Qingdao Port displayed negative performance.

2.2.2Fierce location competitions from north to south are Qingdao Port

Rizhao Port and Lianyungang Port in sequence. Adjacent geographic locations, such as the contiguous Dongjiakou Port and Shijiu Port, make fierce competition of the three parties. In the view of business scope, they both have iron ore, coal, crude oil, container and so on. According to national cargo throughput in 2014, Qingdao Port outplayed Rizhao Port. Rizhao Port, having poor performance over container throughput, enjoys quick growth. The fact that Qingdao Port container business would face threats after the container volume in Rizhao Port reached a certain degree, resulting in the indifferent attitude Qingdao Port held towards the investment in Rizhao-Qingdao Container Terminal Ltd.

2.2.3Scrambling for hinterland

Qingdao Port, Rizhao Port and Lianyungang Port have their own direct hinterlands, but their indirect ones overlap such as municipalities like Linyi, weifang and Jinan in Shandong Province and areas like the middle and the south of Shanxi Province, Shaanxi-Henan region and northern Jiangsu Province, on which circumstances for inland ports, shipping companies, and cargo owners the choice of cooperation partner depends on their management modes and favorable treatments provided by the wharves. For example, Maersk Line is a long-term partner of Qingdao Port, so the possibility to cooperate with other ports is quite small. Naturally, Rizhao-Qingdao Container would seek new cooperative partners and opportunities with difficulties.

2.2.4Inadequate supporting facility

Although Rizhao-Qingdao Container Terminal increased quickly on the container throughput, it, with weak loading and unloading operation, low efficiency, small-scale truck fleet and inadequate supporting facility, had a low cardinal number. Shortage of funds hindered devoting greater effort to specialized supporting facility. In addition, that information was mainly controlled by Qingdao Port led to slow reaction and low efficiency. In April, 2014, Rizhao Port got rail-sea international transport qualifications, in which way international merchant ships would berth at this dock. Moreover, the transit shipments in Rizhao Port could be transported to regions ike Central Asian countries, Mongolia and South Korea, which would be helpful to improve transport capacity.

2.2.5Lack of policy support

"Taking Qingdao Port as the leader, Yantai Port and Rizhao Port as two wings" is the policy of Shandong Province, but due to the preferential policy there are much more problems occurring in actual development. At present, in the view of port-vicinity industries and regional economic development, the competition among ports is still the dominant theme due to lack of market conditions and objective foundation for cooperation. Cooperatively speaking, every port has its own strategies. Especially when it comes to doing similar businesses, it is inevitable for ports to compete with each other and finally break up. In the long run, it is possible for ports to cooperate if they reach a higher level of development. Deep and multi-area cooperation among ports could be achieved by coordinating strategic objectives, building strategic alliances and expanding hinterlands.

2.3The prospect of the container business in Rizhao Port

Currently, Rizhao Port has many cooperation partners such as Sinopec, Petro China, Cosco Group, Shandong Iron and Steel Group, Rizhao Steel, Rizhao Modern Weiya Engine, Rizhao Bank and China Railway Logistics. The leaping development of container business in Rizhao Port could be achieved by innovation, transformation and upgrading in the course of cooperation with those above partners. For example, in the June of 2009, Rizhao Port and Sinopec built a 30dwt crude oil terminal in the form of joint ventures. In the course of cooperating with Jurong Port Company from Singapore, Jurong Port contributed 30％ of the total capital and provided advanced technology and expertise in the March of 2011. In the August of 2013, Rizhao Port enhanced its competitiveness by introducing Cosco Pacific's advanced transport and management mode of containers and relying on its market resources, route advantages and influence. As to vertical cooperation, Rizhao Port advocates joint construction and sharing and building Eurasian port groups in the Western Pacific region. Partners whose resources determine their power, relying on the natural advantages of Rizhao Port, can give play to their own capital advantages, expertise, and ability of market development and marketing so as to seek a path to common development. Bonded by capital, Rizhao Port and its partners promote the deep integration of port with finance and capital market and with the development interests of relevant parties.

By forming specialized division and cooperation based on vertical and horizontal industrial chains, advantageous resources such as business, information, capital, and technology can be "integrated", and the earnings coming from efficiency improvement, cost reduction and value increment, brought by combination and optimization of resources, can be "shared". However，in the course of time and with market changing, the power distribution between Rizhao Port and its partners is changing constantly, in which case it is necessary to make timely adjustment so as to maximize mutual interests. At the end of January, 2015, Shandong Province was identified as the maritime strategic pivot of the national plan of "One Belt and One Road" and the key region along the New Asia-Europe Continental Bridge Economic Corridor. In early February, the adjustment plan of Shijiu Port in Rizhao was approved. The original railway passage of Yanzhou-Rizhao Railway in the north was adjusted to Xingxian-Rizhao Railway in the south, and the original function layout of "mixing distributing with collecting" adjusted to "collecting in the north and distributing in the south". Specialized wharves for cruise ships were added. The above adjustments are of strategic importance to connect with the "One Belt and One Road". Rizhao Port, as an important node and a pivot port, will meet more opportunities.

3. Strategic analysis of the competition and cooperation of the port container business based on "Internet plus" action plan

3.1 Organizing port strategic alliance with information

3.1.1Horizontal integration alliance partners

The top priority of Rizhao Port is to accelerate its development and boost the energy conservation and emission reduction of the port. Compared with 2005, the unit consumptions of integrated energy, production and water in Rizhao Port have been respectively decreased by 35.39%, 19.38%, and 72.33% by the end of 2011. According to the Medium and Long-Term Plan for Energy Conservation in Highway and Waterway raised by Ministry of Transport, coastal ports should, by 2015, reduce their production unit consumption by 8% of 2005. Rizhao Port has realized this goal in advance. The technology alliance is of great necessity for Rizhao Port. First, cooperate with high-end scientific research agencies and then put the technical results into every production procedure.

Rizhao Port has made strategic cooperation with Waterborne Science Institution of Transportation Ministry and achieved great success, which includes building academician and expert workstation, enhancing the exchange and cooperation with high-end scientific research agencies and accelerating the application of technical achievements to production. Second, Rizhao Port can seek cooperation with Tianjin Port for its coal conveying technology and share technology with each other. Due to the application of new technology, new equipment and new process, Tianjin Port boasts high-level modernization and information which rank the top around the whole China. Third, as for the shipping service center and one-stop service, Rizhao Port needs to draw experience from and cooperate with Tianjian Port in order to make great process. Fourth, on the aspect of container terminal's central dispatch, Rizhao Port can choose Shenzhen Port as the partner.

3.1.2Vertical integration dynamic logistics alliance

Vertical integration mainly embodies the alliance between ports and cargo, ports and shipping, as well as ports and parks. In supply chains, the ports, owners, shipping companies, logistics parks, and industrial parks can contribute to cargo supplying and seamless link of distribution, and thus enhance the quality and efficiency of ports.

- Alliance between ports and cargo
  Yanzhou Mininng Group, China National Coal Group, Zibo Mining Group and Lu'an Mining Group are not only the comperative partners of Rizhao Port Group but also its stockholders.
- Alliance between ports and shipping
  Rizhao Port can build partnerships with world well-known shipping companies, such as Mearsk Group, Cosco Group, P&O Nedlloyd, CMA-CGM Group, China Shipping Group, the Korean Air, the NYK(Nippon Yusen Kaisha Line Ltd) and SIT Group.
- Alliance between ports and parks
  Rizhao Port can work with some mature logistics parks like Zhengzhou International Logistics Park, Xuzhou Logistics Park, Lanhua International Logistics Park in Shanxi Province, Gaijiagou International Logistics Park of Ji'nan, Jinxiang International Logistics Park, Jinhua International Logistics Park, Chengdu International Logistics Park and so on.

3.1.3Blended dynamic logistics alliance

Blended dynamic logistics alliance depends on suitable ports and upstream & downstream resources in ports' supply chains. As for Rizhao Port, it can choose the ports whose business scopes are similar to it and handling capacity is within the field's standard. So considering the container, Rizhao Port can choose Shanghai Port; as for the iron ore, it can choose Ningbo-Zhoushan Port; as for the cement, it can choose Yantai Port; on the coal, it can choose Qinhuandao Port and on the liquid chemical and oil product, it can choose Lianyun Port. Viewed from the fierceness of competition and cooperation and the overlapping of economic hinterland, Rizhao Port is suitable to cooperate with Weihai Port, Yantai Port and Qingdao Port in Shandong Province, which needs the government's efforts and the positioning of every port in the strategic alliance. China and South Korea "4+1" Port Strategic Alliance Operation Rules signed by Qingdao Port, Rizhao Port, Yantai Port, Weihai Port and South Korean Busan Port market the operation of "4+1" port cooperation mode driven by Shandong Provincial Government.

3.2 Sharing the informative system of collection and distribution and building regional cooperation system

As one of pivotal ports along the coast of China, Rizhao Port is quickening the establishment of "Intelligent Port" with all its strength. A batch of advanced information and technology are applied to the management of logistics and products for intelligent management of the port and real-time interaction of logistic information, so that the port's collecting and dispatching capacity can be elevated. In the near future, informative and Internet-based managements are fulfilled in large ports, such as the aspects in handling goods at the dock, using e-business in the modern logistics, establishing management platform for the group and so on. Under the influence of the information technology and internet connection, the port can experience significant increase in getting logistics information and improving the service, which brings the new reform of logistic model and consequently achieves the "Internet Plus" action in the port. In recent years, considerable development has been made in the building of the intelligent wharf. Many ports in China have begun to adopt information technologies like internet of things, big data, cloud computing and GIS (geographic information system) in the management of the port. These intelligent technologies indeed make the ports smarter.

The application systems including the port integrated information service platform, the basic database of port and waterway, the e-vise of inland ships, the video monitoring of important ports and shipping lane and network ticket selling for waterway passenger transport have be developed, and generally formed internet-based administrative supervision and management and service for ports and shipping lanes. Henceforth, an increasing number of port cities will be approved to be pilot cities for conducting international e-commerce. All of these are contributable to setting up a modern e-commerce ecosystem of logics in ports, elevating logistics information service, and then make the "Internet Strategy" reach a further level. When referring to the internal contacts in the port, it is necessary to extend the internet to sensor networks so as to form the internet of things and then accomplish the process of automatically collecting and processing data, real-time and online tracing, monitoring, inquiring goods and operating on statistics.

The information and resources in the port can be integrated through the effective organization and merge the data flow, which helps the ports and wharfs to respectively build big data platform and job-scheduling cloud computing platform. That way, various ports can share the cloud computing services and fulfill the Standardized and intelligent operation in the wharf. With regard to port's linking to the external, we need to scientifically integrate the e-commerce, e-government with information service and shift the port logistics, e-port, gross settlement and information inquiring to different platform-based applications and services. We also need to establish and lead port-serving supply chain ecosystem and focus on the central part of platforms to build win-win relationship between ports and chain suppliers instead of exclusively playing certain roles in the chain or blindly widening our scope of business.

3.3 Strengthening government's guidance to information policy

The government should make two-way information interaction with the enterprise through the internet and notify ports relevant policies and institution without any delay to rapidly share and convey the information. The mobile internet technology has motivated the occurrence of mass data-collecting in the ports in big data application times, along with which mass data storage rises, making the data analysis, decision support and some other big data applications become possible. Big data applications featured by cloud computing and cloud storage are ideal devices for ports to realize their interconnections. Depending on the big data technology, people can obtain some regulative information by analyzing and comparing the general data and explore the hidden values, which will lead the policy makers to make better decision.

3.4 Improving the logistics transportation network

As for the process of inward and outward port, Rizhao Port has made intellectualized reconstruction. Internal management system, production system, logistics business system and some other aspects are included in the reconstructions, which make the port more effective in providing logistics information and services and bring about a new logistics pattern, thus realizing the "Internet Plus" in Rizhao Port. The bulk cargo GPS intelligent management system provides great convenience for the port regulators and evacuating truck drivers. With the new RFID card, people can make an arrangement to pick up goods, print the B/L online, as well as inquire the position and inward or outward state of vehicles promptly. What's more, equipped with the RFID card and long-distance call function, vehicles can be monitored and located, and arrive at or leave the port without manual intervention.

After scanning the two-dimensional code downloaded from internet, the worker at the door of the port will shift drivers' cards. And then the drivers can enter the port, weigh goods, load on the store space, weigh goods again and leave the port. Each link in this process is completed automatically and smoothly and the drivers don't need to get off their trucks. This intelligent system and its matched Wechat (2.0 version) public service platform make the first history of the information-based inspection and weight of goods, the visualized management of space storage and the logistics intelligent space shift of major bulks, which reconstruct the port's management process of bulk cargoes' storage and evacuation at root. As a result, the operation efficiency and benefits of the port are dramatically increased, and the congested phenomenon that constantly took place in the port has disappeared. Lianyungang, on the basis of the application of mobile internet technology, is conducting intelligent and information-based production step by step. As for the production at the wharf, further improvement has been achieved in its information-based management system of large-scale general cargo business which is researched and developed independently. The former data-logging pattern which simply depends on manual work has been altered.

After employing the hand-held terminal, the tally men in the field can collect and dispatch the information of sites, cargoes, transportation facilities, and some other operating performance at the wharf. The dispatching efficiency of the general cargo production in the port has been enhanced drastically. Meanwhile, the inspection spot, public security, cargo and shipping companies and consigners can be so close contact with the quantity and distance of goods and some other relative information that the working efficiency and cargo security has made remarkable improvement.

3.5 Building APP platform

The mobile internet technology has been widely spread and used in the ports. Now through mobile devices, staff in Lianyungang can get work news in time, production workers in the wharf can promptly master the operation process and monitor the security and the clients, even they are in remote places, can trace the information of goods at wharf at any time. “Energy conservation and emission reduction” is well improved through the mobile internet technology in the port. Environment-friendly and low-carbon development is an inevitable way of improving the port pollution. Energy conservation and emission reduction, as an emerging field of the mobile internet technology, contributes to the effective monitoring of the energy consumption of equipment and construction and the equipment health condition. Besides, it advances the management of energy consumption and equipment assets, and further optimizes production technology in the port. Hereafter, it is expected that the matched mobile phone clients are developed to transmit and share the data information on line to service the computing, monitoring and decision-making, which promotes the energy regulation to a larger scale.

As for the Foreign Service, the group “one-stop” service platform of Lianyungang Communication Company has been operated steadily for years. It tremendously enhances the business efficiency for customers, and helps them save the cost. In order to provide customers with more facilitated business-handling methods and better experience, this company is launching the “iPort Know-all port affairs”, mobile application software of e-business in the port, and intends to achieve the complete mobility of the existing “one-stop” service. Large logistics e-business platform, characterized by good-sized volumes and wide scales, often depends on sizable regional logistics base. At present, logistics holding companies are not only hold massive freight yards in the port, but also actively strive for the freight yards outside and integrate the resources in the goods yards of the port. After discerning the well-developed trend of logistics in the port, Lianyungang Communication Company audaciously steps into the e-business platform constructing field and devotes to making “the land bridge shipping and trading network ” the most professional e-business platform of Lianyungang.

3.6 Connecting port information from online to offline

Supported by the advanced information technology, the storage management of bulk cargoes and the evacuation of cargoes from Rizhao Port by automobile transportation and railway have successfully docked with the internet. As a result, the real-time stack position monitoring can be available to e-storage yards, the big data of dispatching and shipping goods can be updated at any time, the dispatching order of production can be timely delivered, the accurate position can be made by the operation facilities and the business information can be synchronized and shared. Meanwhile, the harbor district is accelerating the construction of modern logistic information and forming the new pattern of “ One Net and Two Platform”, naming a local area network, a data platform and a computing platform. Information exchange platform swifts the data from dispersion to integration, from production orientation to service orientation, which strengthens the efficiency of the management as well as the network operation and maintenance, and gradually create an intelligent port.

Rizhao logistics information network concentrates on O2O e-business upgrade through information approach, and reach the best optimization of the general resources in the whole districts of the port. Now the logistics information network and GPS can control the management system and Wechat (2.0 version) platform. They connect the transportation, storage and stock dumps with each other by real-time, transparent and rapid means and allocate them all by constant optimization. Since business offices are moved to the network, the port information, the latest news and the shipping lines are easily available. What’s more, Rizhao Port and Rizhao Steel Holding Group Company cooperate to establish an information-switch platform, which guarantees the two-way communication of their both sides. In one aspect, the port timely provides the steel plant with the information including vessels’ arrival and other dynamic information, as well as the steel plant’s vehicle dynamics of evacuating cargoes and operation process. The port acts as the “forecaster” or the dispatcher, which greatly facilitates the production of the steel plant. On the other aspect, the steel plant offers the goods congesting and shipping information to the port.

As long as the vehicles with steel congestion leave the steel plant, the specific information of the goods will be immediately delivered to the port, which also brings great convenience to the port's schedule.

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