TRANSPORT & *LOGISTICS:*
the International Journal

Article history:
Received 15 December 2015
Accepted 21 April 2016
Available online 30 June 2016

ISSN 2406-1069

Article citation info: Huang, S. T., Key factors analysis of strategic alliances in container liner shipping industry. Transport & Logistics: the International Journal, 2016; Volume 16, Issue 39, June 2016, ISSN 2406-1069

KEY FACTORS ANALYSIS OF STRATEGIC ALLIANCES IN CONTAINER LINER SHIPPING INDUSTRY

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Abstract:
Strategic alliances mean the collaboration between firms which look for a synergy effect that each member expects the benefits from the formation would be much more than those from individual effort. Plenty of past studies already reveal theories and considerations for joining the alliance in container shipping industry. Through reviewing related journal and annual report of top 20 container shipping carriers, this study aims to provide insight and important motives for alliance formation. This paper also reveal the executive's viewpoint regarding to current container shipping alliances, especially in Asia/Europe route. Their comments provide key managerial insight as well as motives for collaboration among major shipping carriers.
Furthermore, this paper empirically investigates these motives from service quality perspectives by using quality function deployment. Through the MCDM analysis as well as consulting with senior shipping experts, key factors for forming strategic alliance are identified and the managerial implications are revealed as decision support tool for shipping policy makers, port managers and shipping practitioners.

Key words: *Container shipping; Synergy effect; Strategic alliances, quality function deployment*

1 INTRODUCTION

International container shipping industry experiences important innovation after the 1980s. This is caused by the progress of Asian shipping to stay abreast of the economic development and the authorization of the revised US Shipping Act in 1984. Before the act, container shipping industry is exempt from antitrust law. The act is intended to loosen regulation and promote competition. Consequently, container shipping industry previously dominated by developed countries started to meet large change in market structure and liner shipping conferences with a history of more than a century begin to fall down. Competition becomes more intensified worldwide and many traditional shipping companies are forced to exit market. In such a condition, global strategic alliances emerges rapidly for shipping

companies to cater new requirements of customers. The container shipping alliances have a variety of purposes that may include cost reduction by collaboration and the improvement of facility utilization; service improvement in frequency and new region served through the expansion of capacity; and mutual resources sharing.

Container shipping companies need to operate closely with many different parties such as shippers, freight forwarders, shipping agents, terminal operators, customs clearance, stevedore companies, warehouse service, truckers, inland warehouse operators, railway transportation and consignees. This service-oriented industry provide traditional marine shipping as well as integrated multimodal transport service. Shipper used to be considered as the end customers but several parties operating on behalf of shippers also have important influences to the selection of dependable container shipping services. Furthermore, this industry is extremely capital-intensive with large amounts of assets on vessels, containers, stevedoring facilities and trucks. Increasing number of new service operators make it extremely difficult to stay competitive in current shipping market.

Container shipping industry faces serious challenge not only limit to fierce competition but also influenced by global economy and financial situation. Since container shipping is a global industry, its activities are deeply affected by numerous factors such as freight rates, currency exchange rates, bunker prices and uncertainty of global supply chain. To face the tremendous pressure, major container shipping operators need to re-consider its business situation to join a reliable alliances. Among top 20 carriers, almost all the container shipping carriers are belong to major shipping alliances with an aim to cope with the pressure from market as well as look for possible opportunity to earn more profits. The behavior of the carriers reveals that rather than independent operation, choosing to join an alliances is a good option to overcome the downturn shipping market.

Since the global financial crisis in 2008, major container shipping carriers collaborate to deal with issues such as the surplus capacity of market supply, fierce competition, drop of cargo demand and low profit through alliances formation as well as make preparation for the recovery of economy. In 2011, after Maersk line announced Daily Maersk product with an aim to diversify service on Asia/Europe route, a series of alliance restructure are triggered among major carriers. The service improvement projects closely followed with the announcement of the MSC-CMA CGM alliance on the same trade. Both initiatives seek to oppose Maersk, which currently offers the most comprehensive coverage of the Asia-Europe trade. In 2012, New World Alliance (APL, Hyundai and MOL) and Grand Alliance (Hapag-Lloyd, NYK and OOCL) signed a comprehensive agreement covering the Asia/Europe route as a new G6 Alliance. In March, Evergreen line announced its collaboration with CKYH to compete with Maersk, MSC-CMA CGM alliances and G6 alliances to provide better quality service and intensive sailings up to weekly 8 service loops.

To understand the reason for alliance formation needs not only requires to review all the past academic publications but also annual report of major container shipping carriers since the nature of shipping business is very dynamic. The comparison of both academic research and practical shipping publication are indispensable for drawing the whole picture of the container shipping alliances. Therefore, this paper not only empirically consult with practitioners to construct the MCDM analysis but also reviews literature from academic journal, publication of major carriers, famous shipping consultant to reveal insight regarding to strategic alliances as follows: 1) to describe the evolution and current situation of strategic alliances; 2) to empirically investigate the key service quality requirements improved through alliances by using quality function deployment and MCDM technique; 3) to evaluate the important reasons of forming strategic alliance through literature review 4) highlight executive's viewpoint of strategic alliances; 5) discuss and conclude the empirical study of strategic alliances.

2 MCDM AND QFD PROCESS

Quality function deployment (QFD) is developed by Yoji Akao in 1966 with an aim to advance the characteristics of products. The most significant instrument of QFD is the House of Quality (HoQ) which is initially applied in the Kobe Shipyard of Mitsubishi Heavy Industries for proceeding a new shipbuilding project of an oil tanker. The relationship matrix of HoQ could distribute possible contribution of improvements into service quality requirements [3]. Accordingly, service provider could obtain the priorities of improvements for maximizing the satisfaction of customer. This paper investigates container shipping alliance with service quality perspectives under the QFD framework. The procedure for building the house of quality for computation of the QFD can be constructed by the following steps [2]:

A. Service quality requirements (SRs): The weight of service quality requirement is to categorize the level of importance and satisfaction of each requirement. The result of deployment represents the voice of customers in this model. After consulting with several shipping experts, this research selects 10 service quality requirements as shown in Table 1. Following formula can be used to calculate the weight of service quality requirement after finding the means of importance and satisfaction rating of the investigations. Let $\overline{Xi}$ and $\overline{Yi}$, vi=1,2,…n, symbolize the average degree of importance and satisfaction to service quality requirement . Because the importance degree and the priority of shipper's requirements have the direct relationship, the satisfaction degrees have the inverse relationship. We can acquire the priority rating vi of Ai by $= (5-\overline{Yi})\,\overline{Xi}$.

$$wi = \frac{vi}{\sum_{i=1}^{n} vi,} \qquad \text{(eq. 1)}$$

Consistent with the calculation of this formula, the standard weight of SRs could be obtained. The classical HoQ is shown as Figure 1. [6]

B. Technical characteristics (TCs): Technical characteristics are designed along with a company's service or product based the company's resource and coordination. The single technical characteristic of this research is strategic alliance. By the expert consultation process, this paper will evaluate how strategic alliances improve service quality requirements by computing the relative weight of selected ten requirements.

C. Relationship Matrix: The relationship matrix shows the contribution level and relation of each technical characteristic to each service quality requirement. Typically, symbols may represent three degree of strength (low relationship, moderate relationship, strong relationship, no relationship), such as 1-3-5. They are consist of strong relationship ("■" corresponding to 5), moderate relationship ("▲" corresponding to 3), low relationship ("●" corresponding to 1).

D. Target values：It is vital to shape the relationship between customer requirements and technical measures. The crisp numeric can present the value in precision-based QFD. In practical, the operators often estimate them according to their sensible experience, skilled knowledge and information. On the other hand, the estimation of the relation power between customer requirements and technical measures is typically demonstrated in linguistic values, e.g. 'high', 'medium' and 'low'. Through calculating weight of technical measures, we can find the target values of each Technical characteristic.

In empirical study, this paper applies MCDM process to systematically utilize the strategic alliances as the technical characteristics for improvement among ten service quality requirements. This paper investigates the container shipping business and the service quality requirements are discussed under the QFD concept. The empirical study is conduct with several

experts, practitioners and professors, and the findings and implications is given in the conclusion. [5]

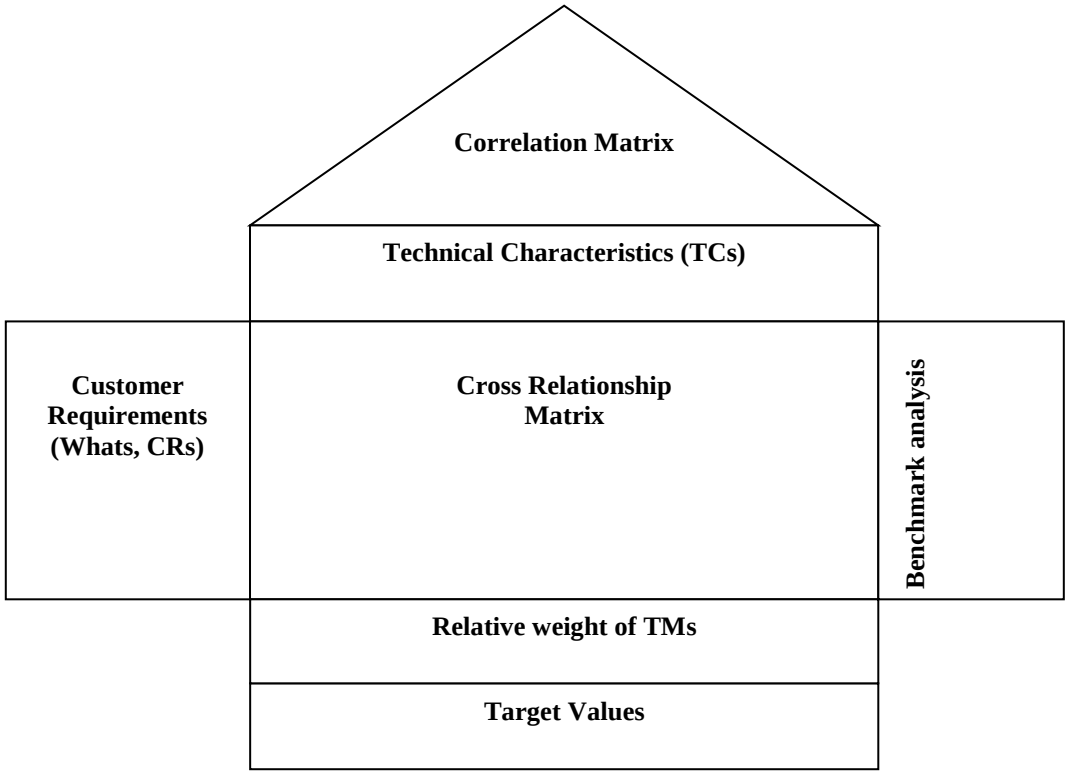

Figure 1. House of Quality (Hauser and Clausing, 1988)

3 LITERATURE REVIEW

Midoro [10] pointed out three out of the four new alliances forced to adjust their structure because of cross-alliance acquisitions and mergers. The restructure of alliance is common for carrier to adapt the changing business environment. Lu [8] revealed key success factor of shipping alliances with management perspective such as partner with similar organization structure and culture, past collaboration and reputation, team work ability, reasonable risk and revenue sharing, flexibility of market change. Yoshida et al. [13] analysed network economies effects of strategic alliance. They think Japanese liner shipping companies have achieved cost reductions through the network extension brought about by the alliances. Notteboom [16] reveals the impact of the larger container ships and mega alliance formation toward container port. The pressure forces terminal operators to satisfy alliance carriers for improving total turnaround time and efficiency. Ding and Liang [17] using fuzzy MCDM method to solve the partner selection of liner shipping alliances. Important attributes are revealed as selection criteria. Lu et al. [7] evaluated CKYH alliance and revealed possible disadvantage during cooperation. Alliance member seems worried about the market competition, inherent instability and inefficient decision making procedure within cooperation partners. They have strong confidence that they will not be merged or acquired by their partners in the alliance. Mitsuhashi and Greve [9] found market complementary, alliance network and resource compatibility as important alliance formation factors in liner shipping and matched partner would improve firm performance and survival chance. Slack and Comtois [11] stressed correct partner selection process would make the alliance successful such as trustful and honest relationships, common strategic goals, and resource sharing. Lam [14] applied hybrid QFD-ANP approach to evaluate

maritime supply chain from sustainable operation perspectives. Firms seeking long-term alliances selected partners with substantial capital and financial stability to survive a market's downturn, as well as the resources required for expansion during a recession. [12, 19]

Tab. 1 *Scholar's findings of forming strategic alliances (Source: Literature review edited by author)*

Considerations	**Scholar's findings**
Finance	1. Selling excess capacity for income 2. Reducing operating cost 3. Invest fewer fleets to maintain weekly service
Economic	1. Economies of scale 2.Resources sharing 3. Operational synergy
Strategic [18]	1. Entering new region with lower risk 2. Alternative strategy for global market uncertainty 3.Opposing with other alliances 4. Attaining competitive advantage without losing autonomy
Management	1. Learning techniques from partners 2.Cooperation with rivalry companies may bring more revenue than competition. 3. Time-consuming coordination is necessary. 4. Carriers can relieve from competition and focus on creating core strength
Global supply chain [20]	1. Expanding service coverage 2. Strengthening global network.
Customer service	1.Increasing service frequencies 2.Achieving customer satisfaction with diversified service
Market structure	When scale of alliance becomes bigger, the oligopolistic or monopolistic characteristics would emerge rapidly such as higher barriers of market entry, huge capital investment and pressure on freight rates because every alliance provides exact same service.
Uniqueness	Each agreement is signed individually under specific situation because of the complexity, uncertainty and dynamics in market.
Merger & Acquisition	Frequent merger among carriers which form a giant alliance may lead the market structure to monopoly or oligopoly pattern. As a result the service quality may not improve and freight rates may remain high with decrease number of competitors.

4 EXECUTIVE'S POINT OF VIEW REGARDING TO STRATEGIC ALLIANCE

This paper argues the executive's comments to consider alliance formations and explore the gaps between theories and industrial practice. In recent years, surplus of capacity and global economy downturn force major carriers to adopt aggressive strategy to survive in the market. This situation may lead to a series of recent strategic alliance restructure in different perspectives to analyse them. It is necessary understand practitioner's perspective to provide the whole picture of current strategic alliance situation.

First of all, from service quality perspective, with the introduction of Daily Maersk to differentiate their service on Asia/Europe route, they improve their products by giving the concept of absolute reliability; shorten transportation time, daily service and penalty systems to enhance customer satisfactions. Second, from the management perspective, the MSC cooperated with CMA instead of competition would help both to increase revenue and handle surplus capacity. The alliance strategy gives them chance to optimize their resources, fleets,

performance and relieve from fierce competition. Third, from the market structure perspective, formation of G6 alliance makes the market more like oligopolistic structure since the giant alliances consist of six powerful carriers due to the diminishing profit and increasing cost pressure. The barriers for new company to entry become very high and independent carrier almost can't survive in this market structure. Alliance formation becomes a good tool to enlarge business scale and gain more market share. Fourth, from the strategic perspective, with the purpose of competing with the giant three alliances, collaboration between Evergreen and CKYH leads the competition eventually from company versus company to alliance versus alliance basis. In the past, Evergreen line seldom participate alliance or agreements with other companies on Asia/Europe route, so the alliance formation may imply Evergreen is obliged to take aggressive attitude under the market dynamics and uncertainty.

Tab. 2 *Executive's viewpoint of strategic alliances (Source: Lloyd's list; Lloyd's Fairplay)*

Executive	Position	Viewpoint
Jean-Louis Cambon (2011)	Chairmen of European shipper's council	The operating alliance among competing mega carriers could reduce capacity but not offer better quality service. The challenge for MSC and CMA CGM to demonstrate their customers that their alliance would improve their quality of service and reliability.
Eivind Kolding (2011)	Maersk Line CEO	Shipper cares about total transportation time rather than transit time. The concept of absolute reliability is the primary task that alliance should promise their shippers because only about 50% containers arrive on time according to Daily Maersk report.
Diego Aponte (2011)	MSC Line's VP	The alliance between two family-owned companies came at a time of deepening losses caused by capacity surplus and slowing world trade. Collaboration may help us to optimise the deployment of our respective fleets, improve transit time and service quality, offer better solution, increase performance and mutual commitment.
Koichi Muto and Jiro Asakura (2012)	CEO of MOL, CEO of K Line	We don't think it's better to combine Japan's Big three liners to form a Japan Line. NYK and MOL are part of G6 alliance while K Line is with CKYH. Even if we all suffered tough situation because of rising yen, oversupply and bunker price, we should work hard in each alliance. MOL believes investing large scale ships with lower slot costs is good for Asia-Europe market.
Anchor. Chang (2012)	Evergreen Liner president	Cooperation between competing liners throughout joint services or slot swaps is common. We'll cooperate with our competitor as long as we meet our customer's need. Evergreen thinks that even in good times, liners should still collaborate with each other to provide diverse service, improve service quality so that a win-win solution can be reached.
Jason Wong (2012)	APL's VP	It is necessary to work with alliance partners on slot swaps to enhance port coverage and frequency. Swap slots is cost-effective to increase port coverage without deploying more assets.

Frank F. H. Lu (2012)	Yang Ming Lin CEO	The cooperation between CKYH lines and Evergreen lines is designed to offer customers the best sailing frequency, transit time, service coverage, stable price and slot supply so as to both fulfil customer needs and control transport capacity more efficiently in view of continuous uncertainties in the global economy.
Neil Dekker (2012)	Drewry Shipping Consultants' Head	The liner shipping is a game of scale and need to raise market share, they need to increase their size of ships to minimize unit cost and more weekly services to become more competitive and they can achieve that through strategic alliances.

Tab. 3 *Relative weight of service quality requirements for alliance formation obtained by MCDM process*

Service quality requirements	*Description*	*Weight*	*Relative weight*
1. Cheaper price	Price of service	0.5	0.1136
2. Speedy transit time	Time spent for transport	0.3	0.0681
3. Service network	Global shipping network	0.9	0.2045
4. Tailor-made service	Ability to serve individual customer	0.1	0.0227
5. Logistics capability	Door to door ability	0.9	0.2045
6. Reputation	Brand value within industry	0.5	0.1136
7. Information Technology	IT ability to facilitate operations	0.1	0.0227
8. Staff ability	Well-trained employee for quality service	0.1	0.0227
9. Solution providing	Innovative solution to customer's difficulty	0.1	0.0227
10. Slot space	Plenty space to provide shipper	0.9	0.2045

5 MANAGERIAL IMPLICATION AND CONCLUSION

The paper empirically explores how the formation of strategic alliances improves service quality requirements of container shipping alliance. The results reveal the top four service quality requirements improved are service network, logistics capability, slot space according to numerical relative weight shown in Table 3. First of all, service network is the key service quality requirement, which can be significantly contributed by alliance formation. Through the alliance approach, partner could share the network each other to access market without large investment. This makes the carrier to serve their shipper with diverse shipping network. Second, regarding to logistics capabilities, the alliance partner could share the resource and knowledge to facilitate resource utilization and information exchange. They could also support inland transport to extend their door to door ability. Famous liner carrier like NYK group has strengthen their logistics service by establishing logistics subsidiary. The logistics ability is very important element for liner carrier to differentiate their service. Third, slot space utilization, of course, could be benefited by alliance formation. Slot space could not be storage and surplus space may have significant impact on carrier's financial performance. Slot exchange among alliance partner will improve this situation and enhance the financial revenue.

As "scale" and "larger ship" become the important competitive trend of container shipping industry, the alliance formation become good option for carriers to pursuit larger "scale" of operation. Carriers nowadays could face trade-off to work independently or to collaborate with other shipping carrier. To deal with the uncertainty of shipping market, joining the alliance will still be one of the most important strategies to stay competitiveness. [21]

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