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AN EVALUATION OF LINER STRATEGIES IN THE CONTEXT OF CONTEMPORARY SUPPLY CHAIN MANAGEMENT PRACTICES

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ABSTRACT

Academic researchers published a sophisticated model of world class logistics in 1995 and recently updated it with a model of 21st century logistics. Although such practices are yet to be perfected in the real world, it provides a yardstick for measuring logistical excellence. An innovative world class firm will pursue sustainable competitive advantage through well-integrated global supply chains. As liner operators are vital members of global supply chains, their contemporary strategies need particular scrutiny to identify elements of congruence or non-congruence. The paper discusses generic liner strategies and identifies the ideal strategy congruent with contemporary supply chain management practices.

INTRODUCTION

We live in an era of increasing business sophistication. The management of business functions has undergone radical reengineering and shifted more towards a system of managing processes rather than functions. Correspondingly, the management of business logistics has gained increasing attention in the last decade and is now considered a core competency of successful firms (Coyle, Bardi, and Langley, 1996). Such firms position themselves through various strategic choices to establish themselves as market leaders in the new millennium. They seek sustainable competitive advantage in the global marketplace through strategic supply

chain alliances that provide them logistical superiority. The supply chain alliance partners of these firms include their suppliers and suppliers' suppliers, and customers as well as various transportation providers and intermediaries.

As international business breaks new ground year after year, the management of business logistics will become increasingly global, complex and challenging. The shift towards world-wide manufacturing and assembling operations will lead to a greater role for ocean liner shipping companies who have provided a historically vital service for shippers, large and small alike. This is because of the increasing preponderance of

time-based competition manifested today in various forms. These include the rapid adoption of innovative inventory management philosophies, like just-in-time manufacturing, reduced cycle time and above all, a greater recognition of customer satisfaction.

While these developments are well recognized by all concerned, the dilemma concerning the economic efficiency of ocean liner markets continues today as in the pre-containerization era. Their role in contemporary supply chains is beyond question. However, economists, policy-makers, and academicians perpetually debate the structure of liner markets and their efficiency outcomes. There is a continuing rift between shippers and carriers, and is often reported in trade journals (Mongeluzzo, 1999). There are also perceived fall-outs from the partial deregulation of shipping services in the U.S. (Bryant, 1999). The objective of this paper is to scrutinize contemporary ocean liner strategies given the much wider scope of ongoing changes in the management of business logistics and supply chain management in general. It will highlight areas of mutual congruity and conflict, and will look into a possible new order in liner shipping that may facilitate the establishment of efficient global supply chains.

THE WORLD CLASS LOGISTICS MODEL (1995) AND 21st CENTURY LOGISTICS (1999)

The Michigan State Global Logistics Research Team released their findings on world class logistics in 1995 (Michigan State, 1995). The study, a continuation of their research on Leading Edge Logistics (Bowersox et al., 1989) and Logistics Excellence (Bowersox et al., 1992), led to the development of a model of World Class Logistics (WCL). It identified the need for simultaneous achievement of four key competencies—positioning, integration, agility and measurement—for world class performance. Although the study did not find any firm that had perfected the simultaneous achievement and fusion of all components of the suggested model, it

established the existence of world class firms that had made a greater overall commitment in their effort towards logistical perfection (Michigan State, 1995).

Positioning, one of the four key competencies of the WCL model, refers to the selection of strategic and structural approaches to logistics operations. Integration leads to the creation of solid supply chain relationships. Agility is a firm's competency with respect to relevancy, accommodation and flexibility. Measurement refers to the internal and external monitoring of results. The model identified seventeen measurable capabilities under each of the four key competencies. These capabilities of the four key competencies are the vehicles for seeking logistical excellence. The researchers also showed that the seventeen identified capabilities are essentially the same throughout all developed nations and that being world class does matter (Michigan State, 1995).

21st Century Logistics, the most recent research report from the Michigan State Global Logistics Team, updated the WCL model and extended it to the broader concept of supply chain management (Bowersox et al., 1999). It reports that the overall average of world class competency of firms did not change significantly from 1995 to 1999 although there were significant improvements in a number of the seventeen capabilities (Bowersox et al., 1999). The study found that while the positioning competency of firms improved, with a greater emphasis being given to providing a high level of service to key customers, the decrease in several areas, including supply chain unification, information technology, information sharing, flexibility, process assessment, and benchmarking, was significant. As a result, the new report focuses on the capabilities that facilitate internal and external integration. The attributes included in the 1995 WCL framework were found insufficient for sustainable competitive advantage barely five years later and have been amended by incorporating factors that emphasize integrated relationships and enterprise extension (Bowersox et al., 1999).

Logistics as a Core Competency

The real challenge of today's managers is not merely attaining competitive superiority but maintaining it in the long run. This requires core competencies and efficient change management capabilities. A firm may not gain competitive advantage in the increasingly dynamic global marketplace through its manufacturing excellence alone. This is where logistical competency and the efficiency of the supply chain alliance become critical for sustained competitive advantage. Such firms strive to make logistics management one of their core competencies and position themselves as leaders in the global marketplace. They segment their logistical services by providing different levels of service over and above their pre-existing superior level of basic service (Michigan State, 1995). As a result, they maintain multiple logistics systems concurrently. Through such a strategy, the firm can cocoon its customers and retain them. Customer segmentation is also advantageous because the most demanding customers could be looked upon as a source of innovation and change (Michigan State, 1995). Such a level of synergy reduces the market uncertainty of the customer as well as that of all channel members.

Supply chain alliances are an outgrowth of the core competency emphasis and the challenges of global competition. They are the modern counterparts of vertical integration. They provide the benefits of joint synergy without the risk of ownership. The most basic requirement for alliance development is that the strategic intent of all partners be compatible and complementary. Among world class firms, there is a strong commitment to increase leverage and reduce waste through supply chain alliances. The 1999 study finds that responsiveness, flexibility, speed, dependability and continued sensitivity to cost will be the drivers of competitive advantage in future years (Bowersox et al., 1999).

A firm with advanced supply chain capability will carefully choose its transportation partners so as to position strategically in the global marketplace. Deep-sea movement of raw mater-

ials and finished goods still constitutes the most practical and logical way to move a good majority of them over long distances internationally. Although international shipping does not enjoy the privileged status of the previous era as the sole provider of vital transportation services, it remains a significant component of global supply chains as it did then. Liner shipping has a direct effect on the procurement and trading strategies of most firms active in the international business market. They play an important role in the simultaneous fusion of the components of the WCL model and the updated 21st Century Logistics model. As a vital member of global supply chains, they play a paramount role in facilitating world class logistical processes. Hence, the rationale for scrutinizing strategies of liner operators in the context of today's sophisticated business logistics environment.

LITERATURE REVIEW

Many scholars have analyzed the strategies of liner shipping companies. Marx (1953) provides a good description of the strategies of liner companies during the formative years that included industrial self-regulation through conference rate making and service rationalization, and also their strategies to limit both internal and external competition. Deakin and Seward (1973), Evans (1977) and Ellsworth (1979) provided further analysis of those strategies in the early containerization era. Recent contributions in this area include those by Heaver (1996) and Evangelista and Morvillo (2000). Evangelista and Morvillo (2000) paraphrase the competitive liner strategies under the traditional categories of cost leadership and service differentiation. They argue that carriers may pursue their cost leadership strategy to the extent of acquiring other carriers and associate such an initiative at the most advanced stage of development of shipping lines. They identify four levels of logistical integration. At the lowest level, they provide solely maritime activities and then progressively move on to providing port terminal activities, inland transport services and ultimately logistical services beyond transportation. Their notion of service differentiation is

derived through the carrier's involvement in the customer supply chain and is induced by demand fluctuations. They state that shippers' supply chain strategy is changing the role of transportation providers. Their empirical analysis establishes that service differentiation and a high degree of inter-firm integration are relatively incompatible based on the sample they analyzed. They caution against generalizing their conclusion as there are other strategic options open to liner firms that are significantly involved in movements to interior points.

Limitations of the Evangelista/ Morvillo Model

The authors acknowledge that the only models they analyzed were cooperative alliances. Aside from this, the frames of reference used by Evangelista and Morvillo do not convey a complete picture of the contemporary supply chain model. Their usage of the term logistical integration conveys an incomplete message, and the examples they provide barely exceed door-to-door transportation capability, which is only one subset of the logistics system. Furthermore, the inter-organizational integration as referred to by them, cannot extend beyond the lower and medium levels they identified with cooperative shipping alliances. Hence, their empirical conclusion that service differentiation and a high degree of inter-firm integration are relatively incompatible is only to be expected, and a fact of life. Furthermore, as uncovered by the 21st Century Logistics Study (Bowersox et al., 1999), the level of integration accomplished by the top manufacturing businesses themselves is unsatisfactory. That being the case, the relatively low level of inter-firm integration between liner companies and their customers and/or third party logistics service providers is an important albeit low-priority issue and premature for empirical analysis. The shippers themselves have a long way to go with their intra-firm integration prior to solidifying their inter-firm integration. It is suggested that one take a broader look at all liner strategies, and identify those that are congruent with the principles of contemporary supply chain

management prior to quantifying the level of integration between liner operators and their supply chain partners.

Methodology

The study will classify contemporary liner strategies into three mutually non-exclusive categories. Each of the strategies will be evaluated in the context of the Michigan State Models of supply chain management. Accordingly, the paper will identify liner strategies that would help the end-to-end distribution needs of their customers and contribute as a partner in the global value chain.

CLASSIFICATION OF LINER STRATEGIES

For the purposes of this study, liner strategies will be classified into three categories, viz., independent, cooperation and integration strategies. A brief description of each of the categories follows next.

Independent Strategy

This is an old strategy and typically used by a new-entrant liner operator. The increasing scale barriers in container shipping have impacted the usefulness of this strategy and with the rare exception of the China Shipping Group, there have been hardly any high profile new entrants in the last few years. Even among the established traditionally independent incumbents, all operators, with the exception of Evergreen, have joined one or more co-operative alliances. Evergreen's niche is its cost leadership, and focuses primarily on port-to-port and round-the-world services. It offers limited door-to-door services using contractual agreements. While Evergreen may indeed become a long-run supply chain partner of one or more of their customers, it is unlikely that their role will extend beyond their core competency of providing traditional liner services. Furthermore, an independent may make use of integration strategies to position themselves as a cost-effective global carrier as illustrated by Evergreen's acquisition of Lloyd Triestino of Italy. For these reasons, the

independent strategy is excluded from further analysis although conceptually it would fit well with a customer's desire to negotiate individually with their supply chain partners.

Cooperative Strategies

Cooperative strategies are strategies pursued by liner operators to bring down their costs and enhance their capacity utilization. These include conferences and consortia as well as their recent incarnations of discussion agreements and alliances, respectively. Although conference agreements play a significant role in the north-south trades in particular, their role in arterial trade routes that include U.S. ports has been curtailed drastically and replaced by discussion agreements (Beargie, 2000). By their nature, a traditional conference agreement goes against the principles of contemporary logistics models. Membership in a liner conference creates a poor impression among one's customers today rather than being the trademark of a quality service-provider. It would be perceived by today's shipper community as an example of the non-customer orientation of liner operators and hence, not in congruence with the contemporary supply chain management practices. As a result, their demise from the major trade routes characterized by shippers with sophisticated logistical needs is understandable. By the same token, the flexibility of discussion agreements makes them relatively tolerable for those shippers although there is a strong likelihood of their coming under increasing regulatory scrutiny (Beargie, 2000).

Cooperative strategies help liner operators to utilize their resources better and reduce their operating costs. The British and other West European shipping lines have been the traditional proponents of asset sharing. U.S.-based shipping lines historically stayed away from such activities for maintaining their operational freedom. The American companies resorted to various in-house techniques to control their costs rather than entering into consortia and other cooperative working arrangements (which their competitors elsewhere did). It

became clear to them in the early 1990's that individual cost-control measures could only go so far and further savings require greater cooperation. This led to a literal explosion of strategic alliances in liner shipping beginning in the mid-1990's (Fossey, 1994; Damas, 1996; and Phillips, 1996). Operators look for the ideal partner(s) with whom to combine their resources in the most effective manner whether those are ships, port terminals or sailing schedules. All major liner routes are dominated today by one or more carrier alliances.

The alliances between container operators generally improve the service frequency and reduce the transit time in key port-to-port corridors. This is vital for shippers who demand more frequent services on the busier sub-trades as it enables them to reduce their investment in inventory. The extensive geographical coverage of an alliance provides all partners with a greater choice of direct port calls. Through careful streamlining of joint services, it is possible to lower port and feeder service-related costs. Other possibilities include the potential for sharing of containers, chassis, equipment and terminals, shared use of feeder vessels, and streamlining of land-based intermodal services. Thus, liner operators stand to gain an overall increase in operating efficiency and some monetary savings through their alliances that could be passed on to their customers. However, there are significant hurdles in the path towards alliance implementation, especially in the non-shipping sector. The level of difficulty associated with vessel and terminal sharing is rather low compared to that associated with other implementation steps, in particular those related to inland operations (Kadar, 1996).

Detractors of alliances point towards the increasing concentration in the sector. Initial reaction to this strategy was that it was merely a marketing gimmick, loading half the ship twice a week rather than loading the whole ship once a week. After a few years of experience, the consequences of liner alliances appear more daunting. Services such as the post-Panamax pendulum, a combination of all major east-west

arterial trade routes linking Asia with the U.S. West Coast and Europe and/or U.S. East Coast through the Suez Canal, are provided by the alliances. Such services raise strong entry barriers for all but the exceptionally strong independents (like Evergreen Lines of Taiwan). It has been observed that carrier alliances only look inward and do not focus on the needs of the customer or the supply chain, and lack customer-orientation (Berzon, 1996). Furthermore, as these arrangements do not truly rationalize excess tonnage, those carriers that embraced alliance-formation as the panacea for all their ills are likely to be disappointed. By the same token, the alliances will only work as long as the partners maintain their comparable competitiveness and efficiency. There is no guarantee that this strategy will be anything more than a short-run arrangement as is well illustrated by the frequent shuffling of alliance partners for immediate operational gains. As a result, membership in a global alliance or a consortium also has limited value from a contemporary supply chain perspective. It is unlikely that this strategy would be particularly appealing to a customer intent on building long-lasting supply chain alliances.

Integration Strategies

The study will analyze vertical and horizontal integration strategies of liner operators as they have a direct relevance to the provision of global supply chains.

Vertical integration. Historically, it has been argued that it was the introduction of liner shipping in the early nineteenth century that eliminated the need for integrating merchant and deep-sea shipping (Casson, Barry, and Horner, 1986). Casson and his team studied 28 shipping companies operating in, or controlled from the UK. The study found that a significant number of the shipping companies were involved in agency services, freight forwarding, stevedoring, warehousing, providing port facilities, road haulage and distribution. Casson credits the above developments to the operational flexibility introduced through containerization,

and emphasizes that containerization has strengthened the incentive to integrate shipping with other modes of transportation and port facilities (1986).

The unitization of liner cargo by using ISO marine containers opened up a plethora of opportunities for liner operators. The use of large container vessels gave them the necessary economies of size in their deep-sea shipping movements without unduly prolonging the time spent in port. With the elimination of legal impediments to intermodalism, human ingenuity began to overcome the traditional boundaries of liner service that until then did not extend beyond the immediate vicinity of ports. Thus, with the arrival of the intermodal era, a new cycle of innovation began in liner shipping. Intermodal systems began to emerge and establish under the leadership of liner companies. It necessitated the coordination of ship arrival times with train schedules and their expeditious inland movement. But, the traditional liner feature of encouraging service competition made it imperative that intermodal capability be a competitive essential rather than a mere option. As cargo volumes reached a critical level, deep-sea liner operators began to take over the operations of their intermodal associates with the twin goals of expanding their area of control and reducing their costs. When one liner operator establishes itself as a multimodal entity, competing firms are compelled to undertake similar operations. In addition to the acquisition of inland transportation companies, other vertical integration efforts by liner shipping companies have included warehouse and distribution centers, freight forwarders, customs-house brokers, and EDI firms. The transition of liner operators into total transportation entities has been referred to as one of the most exciting developments of the intermodal revolution (McKenzie, North, and Smith, 1989).

However, this strategy began to backfire in the late 1980's and early 1990's. As the intermodal systems of vertically integrated liner operators began to mature, their profitability began to decrease rather than increase. The reasons cited

for this includes the excess capacity in liner markets and the alleged cross-subsidization of inland moves by the deep-sea leg. Furthermore, it appears that some liner operators made some acquisitions that were not integrated even after a prolonged period of gestation. They simply acquired channel members purely to keep up with their competitors, or out of grand expectations of creating the best vertically integrated transportation structure. This led to significant restructuring of top liner companies like American President Companies, Sea-Land, Nedlloyd and P&OCL that began in the early 1990's and is still continuing as illustrated by the recent sale of the APL stack-train services. The top tier liner operators are thus streamlining their investments and finetuning their networks.

There are fundamental concerns associated with the vertical integration strategies of liner operators. Part of this stems from the inherent incompatibility between the deep-sea mode and the land-based modes of transportation. Shipping has high fixed costs and low variable costs while the land-based modes of transport have low fixed and high variable costs (Wood and Johnson, 1995). This results in significant economic incompatibility when a liner operator attempts to run its vertically integrated operation. Furthermore, shipping companies have a very traditional hierarchical management structure whereas running an in-house integrated (liner-oriented) supply chain requires more of a team-based, horizontal management structure. Thus, this liner strategy, although ideally suited for facilitating global supply chains, is not easy to implement and requires a virtual catharsis of traditional liner management philosophy.

Horizontal integration. It was believed initially for many reasons that containerization would reinforce the conference system and its market power (Davies, 1990). Liners began horizontal integration as a means of amassing the huge investments required in providing an efficient, containerized liner service. Financial interests and even governmental interests have promoted the operational integration of container operators under their jurisdiction to attain

economies of scale in the environment that containerization spawned (UNCTAD, 1970).

Although one could conjure different variations of the horizontal integration theme, the only model considered here is a merger or acquisition involving liner companies. An examination of such activities in the liner sector shows two divergent trends that a recent trade journal categorized as the full integration type and the multi-brand "federal" type (*Lloyd's Shipping Economist*, 2000). Examples of the first category include the creation of P&O Nedlloyd Lines, the NOL-APL merger and the Maersk-Sealand merger. All these mergers have resulted in the creation of a single entity that has had a remarkable impact on the rest of the players, including the disruption of the alliance structures in the first two cases. The "federal" model implies that the parent company oversees the activities of one or more independently operated autonomous subsidiaries. Separate brand names are maintained and run as individual lines as in the case of CP Ships, Hamburg Sud and CSAV. There is little empirical evidence to support the superiority of one model over the other. In general, this strategy is also designed to lower the unit cost of operation through gains in economies of scale very similar to that of the cooperative strategies discussed earlier. However, it provides greater control in the decision making process albeit at a heightened level of business risk. While there are likely to be even more defensive takeovers in the market, the impact of this strategy from a global supply chain perspective is unclear. However, one can conjecture that the emergence of a merged strong operator (such as the P&O Nedlloyd Lines, or the new APL brand, or Maersk-Sealand) with global capability is attractive to a shipper with sophisticated supply chain demands. This is especially the case when these operators also possess significant end-to-end distribution capability besides having an exceptionally well-positioned core competency. Such capabilities are irrelevant unless the carrier exhibits the willingness and flexibility to work with their customers and design tailored logistics packages. This would have been

unlikely but for the introduction of recent regulatory changes, and are discussed briefly next.

CHANGES IN LINER REGULATORY ENVIRONMENT

The global supply chain environment underwent dramatic changes resulting from recent institutional interventions in the liner market. Specifically, the U.S. Shipping Act of 1984 was amended by the Ocean Shipping Reform Act of 1998 (OSRA) and partially deregulated the liner services in the U.S. foreign commerce. Although the amendments enacted are numerous, the ones that have a greater impact from a supply chain perspective are related to the introduction of confidential service contracts.

The service contract provision is the most deregulatory component of the new legislation. It has expanded the scope and purpose of service contracts from the original 1984 Act and made it a truly powerful marketing tool for shipping companies to differentiate their services from their competitors. The new service contract provision allows the co-existence of a discriminatory contract carriage system with the common carriage objectives of the tariff system. Although contracts need to be filed confidentially with the Federal Maritime Commission (FMC), except for contracts on exempt commodities, the previous requirement to file essential terms of a service contract in tariff format for public review is seriously curtailed. Strategic components of a service contract such as inland points for intermodal movements, freight rates, service commitments and liquidated damages for non-performance can now remain confidential. Conferences and consortia will not have the right to restrict its members from negotiating individual contracts with shippers although they may issue voluntary guidelines relating to terms and procedures for such contracts. The voluntary guidelines must be submitted to the Federal Maritime Commission. Another significant departure from the 1984 Act is that a contract may be based on percentage of cargo of the shipper, not permissible earlier because of its connotation

to a loyalty contract. Loyalty contracts are still illegal under OSRA. However, OSRA has altered the definition of such contracts to one that includes a deferred rebate. Individual shippers, shippers' association as well as a group of unaffiliated shippers may enter into service contracts. Similarly, a group of carriers other than a conference is also allowed to enter into service contracts.

Although the new service contract provision allows shippers to sign confidential service contracts of a global nature, shippers and carriers have been slow to change their business practices because of their lack of familiarity with the new freedoms. An informal FMC survey found that 83% of 408 contracts filed by the top 13 ocean common carriers in the U.S. foreign trades lacked confidentiality clauses and only 77% of the remaining 17% required complete confidentiality (Beargie, 2000). Furthermore, a majority of the contracts are still negotiated during four to six weeks in early spring and many contracts are still confined to a single trade route with duration of one year or less and there are very few customized contracts. It is important to note that operators such as Maersk-Sealand are reporting a higher than anticipated number of global contracts (Beargie, 2000). As these cargoes are typically high value items and account for a higher percentage based on overall cargo volume, it is possible that such contracts will lead to dedicated supply chain alliances in the future. Maersk Logistics (Gillis, 2000) and APL Logistics are two outstanding examples of integrated supply chain initiatives currently available to international shippers.

CONCLUSIONS AND MANAGERIAL IMPLICATIONS

The paper discussed developments in contemporary supply chain models such as the world class logistics (WCL) model and the 21st Century Logistics Model. It also scrutinized three major categories of generic liner operating strategies. All strategies have their respective pros and cons when viewed in the context of establishing global supply chain alliances. Even the much maligned

conference strategy has the advantage of providing regular and reliable services at predictable freight rates. The most basic incongruity arises when shipper clients are unable to deal one-on-one with their liner shipping partners. Ideally, the vertically integrated independent liner operators would provide the best fit and be most congruent in supply chain alliances as they could possess logistical capability as well as flexibility. A vertically integrated liner operator who is capable of providing consistently reliable and tailored end-to-end distribution services will be a true asset in any world class firm's supply chain. However, that strategy, attempted by a handful of liner operators in the late 1980's and early 1990's, turned out to be structurally incompatible with liner economics and organizational structure in the real world. Accordingly, this is not a feasible option for shippers today. The next best option for transportation managers is to seek a liner operator pursuing a horizontal

integration strategy through mergers and/or acquisitions. The partial deregulation of liner services in the U.S. provides the right environment for these initiatives to pursue the challenge of integrated supply chain partnerships. Top tier liner operators are making good use of this strategy and also investing in powerful information systems, another prerequisite for efficient supply chain management. These global operators focus on creating vertical alliances with their land-based counterparts and streamline their joint operations in providing customized end-to-end distribution services for their customers. Thus, they are on the right course to providing a variety of value-added services despite shedding some of their initial land-based assets. These firms are well positioned to benefit from the sophistication of their logistical capability as they can provide tailor-made services for their world class clients in the new millennium and embark on a strong era of global supply chain alliances.

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