

## **The Role of Knowledge Management as an Innovative Strategy in Maritime Logistics Management**

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**Abstract:** *Maritime logistics is referred to as the process of planning, implementing, and managing the movement of goods and information which is involved in the ocean carriage. As a central component of global logistics systems, maritime operators such as shipping lines, port terminal operators and freight forwarders now have to perform both sea transport-related services and other related and wider logistical services, and to be well inter-linked with other players in the total logistics flow in an efficient and effective manner.*

*This paper attempts to provide an understanding of the concepts of maritime logistics management and maritime logistics value, in order to clarify the strategic significance of maritime logistics value. In addition, the adoption of a knowledge management strategy as an innovative and effective business practice for the 21<sup>st</sup> century is explored for enhancing maritime logistics value since the knowledge-based benefits of such a strategy include higher operational efficiency and service effectiveness.*

**Keywords:** *Innovation, Knowledge Management, Maritime Logistics, Strategic Management.*

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### **1. INTRODUCTION**

As the concept of the enhancement of maritime logistics value is strategically important to maritime industries, an attempt is made here to adopt and apply practices and theories such as the knowledge management perspective to maritime operations from the field of strategic management. This is accomplished by means of a literature review.

### **2. REVIEW OF LITERATURE**

Previous strategic management studies have shown that through the successful management of knowledge resources, firms can create a higher level of organisational productivity and service quality, and organisational innovation and uniqueness (Nonaka, 1994, Grant 1996, Teece, 1998).

Such a contention could prove that a knowledge management strategy can be helpful for maritime logistics operators in maximising their logistics value, since the knowledge-based benefits give a rise to higher operational efficiency and service effectiveness (Nonaka, 1994, Grant 1996, Teece, 1998). Firstly, an attempt is made to define the concepts of maritime logistics and maritime logistics value after which, the importance of a knowledge management strategy as a creative and innovative measure to enhance maritime logistics value is discussed.

### **3. THE CONCEPT OF MARITIME LOGISTICS AND MARITIME LOGISTICS VALUE**

Logistics is the process of managing the flow of raw materials, inventory, finished goods, services and related information from the point of origin to the point of consumption (Coyle et al., 1999). Maritime transportation is responsible for carrying and handling cargoes across the ocean and consequently connects dispersed transportation linkages world-wide between consigners and consignees. It also plays a bridge role in the connection of all the entities in logistics (e.g. customers, suppliers, plants, warehouses and other channels). If maritime transport is not well integrated into the whole logistics flows, additional costs, unnecessary delays and accidents may

arise, thus distorting the smooth flows of logistics. Hence, maritime transportation should handle cargoes in a highly integrated manner by keeping pace with other logistics components (O'Leary-Kelly et al., 1999). The integrated demand for maritime transport brings on a 'maritime logistics' concept (Panayides, 2006).

A maritime logistics system can be divided into primary and secondary activities. The primary activities consist of the major functions of the maritime operators (i.e. shipping lines, port/terminal operators and freight forwarders). The secondary activities are the activities which support the primary activities by helping them to run more effectively. Additional logistics services of the maritime operators and their organisational capability, i.e. human resource management, information system, administrative skill and financial support, are essential in supporting the primary activities.

The maritime operators of a maritime logistics system are inter-linked with each other as suppliers or buyers. For example, shipping lines, who choose a port for their vessels being anchored, are the main customers of port/terminal operators; freight forwarders, who work for shippers, are the customers of shipping lines. If the maritime logistics system can prove that the services are valuable enough for their customers to willingly purchase the services, then maritime logistics value is created (Anderson and Narus, 1991).

Maritime logistics value would be improved when the maritime logistics system greatly satisfies customers with a higher quality of services (Rutner and Langley, 2000). As a result, the highly valued maritime logistics service leads to the high performance of individual operators and the entire logistics system. Maritime logistics is thus referred to as the process of planning, implementing, and managing the movement of goods and information which is involved in the ocean carriage. As maritime logistics is a concept developed from the study of maritime transportation within the context of logistics, three key parts of maritime transportation make up the maritime logistics system: port terminal operations, shipping and freight forwarding.

The value created by the maritime logistics system can be defined as maritime logistics value. It follows that higher maritime logistics value would lead to greater customer satisfaction as well as higher performance of both individual operators (such as ports and terminals) and the entire logistics system (Lee and Song, 2010).

#### **4. A STRATEGIC MANAGEMENT APPROACH FOR MARITIME LOGISTICS VALUE**

Strategic management refers to the process of 'formulating, implementing, and evaluating cross-functional decisions that enable an organisation to achieve its objectives' (David, 2005). Maritime operators are involved in global business through moving goods across the world. Shipping lines navigate on the regional and/or global scale carrying cargoes to a variety of destinations. As one of the players in maritime logistics operations, freight forwarders also need to process a number of documentary works related to international trade on behalf of shippers, and to handle logistics activities such as warehousing, inventory management and inland transportation in both domestic and foreign countries. Therefore, freight forwarders should be well versed in the foreign countries where their businesses operate.

Port/terminal operators are also engaged with global operations. For example, global leading terminal operators, such as the Dubai Port World, Port of Singapore Authority Corporation and Hutchison Port Holdings, are all actively expanding their business boundaries across the world. Consequently, the scope of their operations overlap with each other on a regional basis, thus creating a situation where they must simultaneously compete against each other in those demanded markets (Janelle and Beuthe, 1997). It can thus be gathered that maritime operators are considered as a global business unit who operate in more than one country (Hill, 2001). The enhancement of maritime logistics value can therefore be considered as a strategic goal of maritime operators.

It is indicated by strategic management literature that as a component of business level strategy, the knowledge management strategy of a firm contributes to organisational innovation, uniqueness and a higher level of organisational productivity and service quality (Nonaka, 1994, Grant 1996, Teece, 1998). As these benefits are essential to achieve operational efficiency and service effectiveness in maritime logistics operations, a knowledge management approach would

be a desirable strategic option for maritime logistics operators in maximising maritime logistics value.

### **5. A KNOWLEDGE MANAGEMENT STRATEGY FOR ENHANCING MARITIME LOGISTICS VALUE**

Strategic management literature claims that knowledge is arguably one of the most important intangible resources that enable firms to create organisational innovation, uniqueness, higher level of organisational productivity and service quality (Libeskind, 1996, Spender, 1996, Penrose, 1959). This recognition and proven claim bring about a perspective of knowledge-based management. Knowledge is defined as 'valuable information whose validity has been established through tests of proof, and therefore is distinguished from opinions, speculations, beliefs, or other types of unproven information' (Libeskind, 1996).

Knowledge is helpful in creating the uniqueness which provides firms with the difficulty to imitate, and promotes operational efficiency and service quality improvement. In addition, by successfully managing knowledge, firms can create powerful organisational competence for innovation and dynamic capability (Grant, 1996, Teece, 1998). Generally speaking, knowledge management consists of two parts of a process: that is, (1) acquisition/creation and (2) integration/application of knowledge (Nonaka, 1994, Spender, 1994).

The effectiveness of knowledge management has received great attention recently in the logistics sector. It is recognised that organisational learning and knowledge management help firms to better learn about newly implemented logistics operations or key functions, and those operations and functions then enable firms to be easily integrated into the whole logistics system (Esper et al., 2007). This implies that the maritime transportation system, which is seen as a crucial node in the global logistics chains, can also maximise its value through adopting the knowledge management system in an effective manner.

### **6. THE TYPES OF KNOWLEDGE**

Knowledge in the maritime context is defined as 'useful information or know-how for maritime logistics value' (Libeskind, 1996, Spender, 1996). As maritime logistics operators are regarded as typical international firms, which rapidly extend their scope and size into worldwide global markets, maritime logistics knowledge can be categorized into two types of knowledge- market specific and firm-specific.

Market-specific knowledge is referred to as useful information and know-how of the industry and market which would entail information about maritime transport industry, for example, new trends, business culture or practice of the market, and governmental regulations of the industry, customer demands on a firm's service, and strategy and behaviour of competitors. Firm-specific knowledge on the other hand, encompasses a certain operational technology, experience and expertise of the employees, and organisational know-how about practices or procedures. Those two types of knowledge would help maritime operators to adapt themselves to a new business environment, and learn innovative business skills and practice. This will, in turn, lead to the refinement of their competitive capabilities.

### **7. SOURCES OF KNOWLEDGE ACQUISITION**

Knowledge can be acquired from both external and internal sources of a firm but the external sources such as inter-organizational relationships become more important because firms can gain a lot of knowledge by establishing co-operative relationships such as social network relationships with other organisations. A social network is defined as 'a set of nodes (e.g. persons and organisations) linked by a set of social relationships (e.g. friendship, transfer of funds and overlapping membership) of a specified type' (Laumann et al., 1978). Previous literature agrees that firms can acquire knowledge from a social network where they are embedded, since the network provides a lot of chances to get valuable knowledge and resources (Gulati, 1999, Mcevily and Zaheer, 1999, Rowley et al., 2000). Such a view has brought about a network embeddedness perspective.

With the acknowledged informational benefits of the co-operative network, network embeddedness (e.g. high density and strong ties) is regarded as the first source of knowledge

acquisition for maritime logistics operators. Maritime logistics operators work within their own business networks by being vertically and horizontally interconnected to each other. The business networks of maritime logistics operators have recently become bigger and more complex, and the structures and practices of the network have greatly changed. For example, as shipping lines have begun to enter port terminal operations, they have then become the new competitors of the port terminal operators.

Alliances and integrations among large shipping lines have facilitated the hub-and-spoke system among ports. The global expansion of shipping lines may also influence the behaviour of freight forwarders and their business relationships. Port terminal operators produce the worldwide network by globally extending their business scope and scale. Maritime logistics operators may have a lot of opportunities for learning through interaction with the worldwide co-operative networks. The co-operation may include both forms of formal (e.g. strategic alliances, joint ventures, associations and consortium) and various types of informal relations (e.g. meetings or emails). As a result, maritime operators with strong ties are more likely to share valuable and fine-grained knowledge with one another.

Although the co-operative network could be helpful for knowledge acquisition, the effectiveness of knowledge acquisition may be promoted by the extent of competition among the organisations in the network (Tsai, 2002). In this respect, the positive interaction effect between co-operation and competition on knowledge sharing advantages among firms can be expected. Strategic scholars introduce the 'co-opetition' concept to describe such a positive effect of simultaneous co-operation and competition. Co-opetition is referred to as the interdependent relationship in which competition and co-operation simultaneously occur between two or more rivals competing in global markets (Tsai, 2002, Brandenburger and Nalebuff, 1995, Luo, 2004).

It is thus assumed that co-opetition facilitates inter-organisational learning and knowledge sharing, which may help to enhance firms' performance by improving organisational efficiency and effectiveness. Hence it is expected that the co-opetition in the networks among maritime logistics operators could promote excellent knowledge acquisition, rather than that which is achieved when each activity is pursued separately. In this sense, the co-opetition in the network (Dagnino, 2007) is regarded as the second source of knowledge acquisition of maritime operators.

## **8. THE IMPLICATIONS OF THE APPLICATION OF ACQUIRED KNOWLEDGE FOR IMPROVED MARITIME LOGISTICS VALUE**

The successful application of the acquired knowledge may accelerate the improvement of maritime logistics value. By continuously acquiring useful information, maritime operators can catch up on new patterns and business practices in the industry, reduce environmental uncertainty and eliminate wasteful activities. Such benefits may contribute to the reduction of time and costs in their operations. In addition, maritime operators that can prominently absorb and apply new knowledge can reform their working procedures in a more systematic and innovative manner. This may lead to a more productive organisational routine or culture. Consequently, those organisations may gain numerous advantages over their rivals in improving operational efficiency.

Knowledge management also allows maritime operators to achieve significant customer information, thereby allowing for the constant updating on market demands. Proactive maritime operators, who listen to customers' feedback on their service and persevere in their efforts to respond to various customer demands, may provide their services in a more responsive and flexible way, and elevate the grade of their service reliability. They can also learn from other firms' know-how on the business, and then apply it to their own situation, which could help to improve the uniqueness of their particular service. Thus, managing knowledge effectively is a crucial source for the high quality of maritime logistics service.

## **9. CONCLUSION**

In today's global supply chain environment, maritime operators have had to conduct businesses in a highly volatile environment. The increase in customer power, the global expansion of port/terminal operators and shipping lines in scope and scale, intense competition and the worldwide financial crisis are some of the challenges that the industry is facing. Under the

dynamics of this environment, maritime operators are forced to play a significant role as an integrated logistics component and improve maritime logistics value at the same time.

This paper made an attempt to define the concepts of maritime logistics and maritime logistics value after which, the importance of a knowledge management strategy as a creative and innovative measure to enhance maritime logistics value was discussed.

An effective knowledge management system would offer a useful innovative and strategic solution to maritime operators. By collecting valuable information about their suppliers, customers, co-operative partners and business environments, maritime operators can mitigate the uncertainty of their business environment and learn new business patterns of the industry. This practice can also help maritime operators to respond more easily to customer demands, apply the acquired knowledge at the right time and place to reduce time and costs of the firm and accelerate the provision of flexible services. Maritime operators can thus become effective links in the logistics chain as a part of a global distribution channel.

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