Introduction to maritime logistics

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Background

Globalization and transport revolution, logistics integration and the consequent expansion of the maritime industry have redefined the functional role of shipping and ports in global logistics and supply chains and have generated a new pattern of freight distribution. The rapid increase in world trade in the past decade has restructured the global maritime industry bringing about new developments, deregulation, liberalization and increased competition. There have been dramatic changes in the mode of world trade and cargo transportation, characterized by the prevalence of business-to-business and integrated supply chains. These changes have been embodied by the increasing demand for value-added logistics services and the integration of various transportation modes such as inter- or multimodal transport systems. As a consequence, the business stability and sustainability of the industry is largely subject to how well it adapts to such a dynamic environment. Therefore, the high quality of logistics services and the effective and efficient integration of transport systems offered by a maritime operator (i.e., a shipping company or port/terminal operator) have become an important issue.

Maritime logistics has been traditionally regarded as the primary means of transporting parts and finished goods (viz, outbound logistics) on a global scale and has recently attracted considerable attention from academics and practitioners alike. However, the term ‘maritime logistics’ is not easy to define and its precise definition, scope and role within the global supply chains are yet to be established (Song and Lee, 2009).

The first attempt to define maritime logistics was made by Panayides (2006), who suggests that, for a better understanding and ultimate definition of the term, the starting point should be to consider the underlying
scope and characteristics of the two areas making up the term (i.e., ‘maritime transport’ and ‘logistics and supply chain management’). On the one hand, maritime transport (i.e., shipping and ports) is clearly concerned with the transportation of goods and/or passengers between two seaports by sea; on the other hand, logistics is the function responsible for the flow of materials from suppliers into an organization, through operations within the organization, and then out to customers. A supply chain is composed of a series of activities and organizations that move materials (e.g., raw materials and information) on their journey from initial suppliers to final customers. Supply chain management involves the integration of all key business operations across the supply chain. In general, logistics and supply chain management relate to the coordinated management of the various functions in charge of the flow of materials from suppliers to an organization through a number of operations across and within the organizations, and then reaching out to its consumers (Harrison and van Hoek, 2011).

Based on this clear-cut understanding, Panayides (2006) goes on to discuss the issue of convergence of maritime transport and logistics. These two terms are largely attributed to the physical integration of modes of transport facilitated by containerization and the evolving demands of end-users that require the application of logistics concepts and the achievement of logistics goals. At the centre of maritime logistics is, therefore, the concept of integration, be it physical (intermodal or multimodal), economic/strategic (vertical integration, governance structure) or organizational (relational, people and process integration across organizations).

In this process, a number of issues still require further elaboration and explanation. This book brings together the key contributions in the field of maritime logistics from leading academics and researchers across the globe.

Outline of the book

Part I consists of five chapters introducing maritime logistics. In Chapter 2, Lee, Nam and Song provide a precise understanding of the concept of maritime logistics and a guideline for value creation of maritime logistics systems. The chapter addresses such issues as the importance of maritime transportation in an entire logistics system, the definition of maritime logistics and maritime logistics value, the main activities of maritime logistics, and the process of maritime logistics, as well as the significance and strategic implications for maritime logistics operators.

In Chapter 3, Yercan and Yildiz focus on developments in international maritime transport by emphasizing the developments in global trade. They offer a broad idea of logistics and its interaction with international trade by providing general characteristics of logistics and the interrelation of various business areas. They build a background to the interaction between logistics and the transport industry within the global economy, followed by a more
in-depth discussion on developments in the global economy and the maritime transport industry in relation to international trade.

Chapter 4 by Hayashi and Nemoto analyses global intermodal transport that combines maritime and other transport modes, explaining the concept of intermodal transport and its components and characteristics, discussing the function of containers in the development of intermodal freight transport and logistics, and introducing typical global intermodal transport services with some examples in North America, Europe and Asia. They discuss the role of intermodal transport facilitators and their services, and review and predict the development factors affecting intermodal transport.

Finally, Osterman and Osvalder in Chapter 5 deal with the human element of maritime operations arguing that mechanization, automation, information and communications technology have made many manual tasks redundant, enabling ship and cargo handling operations with a minimum of manpower. However, there is yet an area of potential to acknowledge and develop in the effort to improve maritime logistics – the role of the human element and the interface between human and technology in the various man–machine systems in the global supply chain. The chapter puts forward a number of ideas to be seriously considered in the industry for the present and future.

Part II covers topics related to the management of logistics for the shipping sector. In Chapter 6, Ducruet and Notteboom analyse liner service networks as configured by container shipping lines. They discuss the drivers of and decision variables in liner service design as well as the different liner service types. Next, the chapter provides a global snapshot of the worldwide liner shipping network based on vessel movement data. The changing geographic distribution of main inter-port links is explored in the light of recent reconfigurations of liner shipping networks. They move on to the position of seaports in liner shipping networks, referring to concepts of centrality, hierarchy and selection factors. They conclude by elaborating on the interactions and interdependencies between seaport development and liner shipping network development, notably under current economic changes.

The growth of world container trade during the last decades reflects the coalescent markets in the world. The geographic separation of supply and demand has raised expectations about transportation services. Keeping up with the growth of global container traffic was considered one of the biggest challenges. In addition, customers expect fast and reliable services in a wide geographical network. Vessel capacity and utilization provide only one possibility for competitiveness. Vertical and supply chain integration are characterizing the modern transport industry, as transport businesses are gearing up towards global logistics services based on the principle of the ‘one-stop-shop’. To accomplish this goal, it is necessary to integrate port, hinterland transportation and logistics management services. It follows that strategic aspects of supply chain integration and diversification are of significant importance in the contemporary shipping industry. In Chapter 7, Panayides, Wiedmer, Andreou and Louca, after having explained the basic
Introduction

concepts of diversification and supply chain integration, analyse the recent trends, developments and current situation in the maritime shipping industry and carry out an empirical investigation into the relationship between supply chain integration and shipping firm performance.

Chapter 8 by Baird seeks to analyse container shipping line strategy relating to the provision of added-value logistics services. The chapter aims to identify, analyse and compare/contrast the logistics strategies of container shipping lines. The study involved a short questionnaire survey of the top 20 container shipping lines to help investigate these questions. The results of the survey, plus supporting information, are analysed to provide a summary of container line strategy with respect to the provision of logistics services. His analysis includes several brief case studies that seek to review and analyse the specific logistics activities and strategies within several of the top 20 container lines. The case studies offer a more detailed insight into the different approaches adopted by major global container lines with respect to the development and provision of logistics services. The purpose of the overall study is to help develop a wider picture concerning what/how liner shipping competitors are doing with regard to provision of logistics and value-added activities, to assess the extent of these activities in terms of logistics services provided, and to offer an indication as to how this might evolve in future.

Desrosiers in Chapter 9 focuses on the transfer of bulk petroleum at fixed terminal facilities and introduces the reader to the logistics of bulk liquid. Three major components of petroleum movement are introduced (the petroleum per se, the cargo terminals and the ships), followed by the practical steps involved in transferring this valuable liquid. In addition to the physical movement of petroleum, contractual aspects of petroleum movement and custody transfer are discussed to add context to the need for careful monitoring and proactive efforts by all parties on the scene to prevent both fiscal and cargo loss. It is argued that knowledge of the legal procedures and processes involved in the transfer of bulk petroleum is important to understanding the constraints and problems that can and do arise. This knowledge will allow the practitioner to not only plan more effective operations, but enable comprehensive action to improve the processes and make more effective and informed decisions.

Finally, Chapter 10 by Comtois and Lacoste covers dry bulk shipping logistics. The globalization of economic activities has led to a profound mutation in the dry bulk trade. The growth in the amount of dry bulk carried by sea and the mutation in the direction of flows are some of the major phenomena. The steady growth has resulted in intense demand thereby increasing the competitiveness of bulk logistics. Bulk commodities have a low value/weight (or volume) ratio implying that the efficiency of land and marine transport has an impact on value added. The handling conditions of dry bulk materials are influenced by a wide range of factors such as size and weight. Handling equipment is often custom-designed for specific dry bulk commodities. There are various types of contractual arrangements used for the shipment of dry bulk commodities. The command centre of dry bulk
trade is not always commensurate with dry bulk port location. Ships and consignment size vary enormously. These conditions raise a series of key issues that are fully discussed and analysed in the chapter.

Part III covers the logistics management for ports and associated sectors. Roso and Rosa in Chapter 11 focus on the concept of dry ports. Dry ports are regarded as a means to increase port throughput and hinterland reach, and to transfer parts of port operations to inland terminals by relying on intermodal transport. A dry port is defined as an inland intermodal terminal directly connected by rail to seaport(s) where customers can leave/pick up their units as if directly to a seaport. In addition, the dry port is also a means to rationalize transport in and out of a port by bundling the flows and transferring container transport from road to rail, thus reducing congestion in the proximity of the port – typically relevant for port cities – and bringing about other environmental benefits. They argue that, to fully discuss the dry port concept, it is useful to mention intermodal services and review a number of different shapes that an inland freight terminal may take.

Since the hub-and-spoke concept was introduced to the aviation market after the US airline deregulation in the late 1970s, it became a primary distribution model employed by leading international logistics companies. This pattern drives the companies to consolidate shipments on a large scale at major terminals (hub) and to redistribute the smaller shipments to their respective destinations via radial links (spoke). In the field of logistics and supply chains, however, the hub concept has been often introduced in various terms in accordance with functionality, such as logistics centre, logistics zone, freight terminal, distribution centre and warehouse. Such a heterogeneous terminology on the concept of logistics hub seems still in usage by practitioners and academics alike. Having recognized this rather ambiguous concept and definition in the literature, Nam and Song in Chapter 12 attempt to define the logistics hub concept that is applicable to the maritime industry by synthesizing existing studies/perspectives and examining its possible implications.

Bergqvist in Chapter 13 deals with hinterland logistics. Some of the load units arriving at seaports are transhipments for other seaports, while others have inland destinations. The hinterland transportation system enables load units to be transhipped between seaports and inland destinations. The term hinterland is often referred to as the effective market or the geo-economic space in which the seaport sells its services. The logistics related to the hinterland involve many actors and activities, and require intense collaboration and coordination to work effectively and efficiently. Hence, hinterland logistics and transportation have become a crucial part of ensuring an efficient supply chain.

Chapter 14 by Centin discusses the organizational aspect of port logistics with a conceptual framework established. The changes in the traditional role of ports put responsibility on port authorities as the administrative bodies of port organizations. Their landlord, regulator and operator roles are shifted towards a ‘coordinator, facilitator and integrator role in port
clusters, international transport, logistics and supply chains’. As the roles and functions change, so too do the goals. The changing goals also change the organizational effectiveness criteria. It appears that in today’s port business, commonly used port performance measures such as efficiency, profitability and growth are not enough to assess a port organization’s success at all points. With respect to the developments in logistics chains, the chapter covers a wide range of related matters such as port-logistics chain integration, adaptability to the changes in the environment, customer orientation and satisfaction, information and communication management, service quality and provision of value added and intermodal services, innovation and resource acquisition.

Chapter 15 by Woo, Pettit and Beresford aims to investigate the effect of supply chain integration of seaports on port performance by examining the causal relationships among the integration strategies of seaport terminals along the supply chain, and the antecedents and consequences of the integration strategies. The integration strategy is termed ‘Port Supply Chain Integration’ (PSCI) and the antecedents of PSCI are identified as port supply chain orientation. Logistics performance of ports is considered a consequence of PSCI because it is suggested that a traditional performance measure such as cargo throughput is not sufficient for a proxy of port performance in the global supply chain era.

Finally, in the Conclusion, Panayides and Song provide an overall conclusion to the book by considering in particular how the topics discussed can drive further research and development for the maritime logistics area.

References