Chapter X

Applications: Collaborative Transportation and Consolidation in Global Third Party Logistics

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Abstract

This chapter introduces the applications of collaborative transportation and consolidation management in global third-party logistics. These practices are driven by the quest to improve service and reduce cost simultaneously under an e-commerce model of global supply chain management. The detailed development and elements of collaborative transportation and consolidation models are discussed along with case illustrations. Furthermore, a quantitative model using mathematical programming is developed to examine various consolidation policies in a global third-party logistics provider. A case using collaborative consolidation management is presented, and the results show a 6.6% and 18.2% improvement for service and cost comparing with existing practice. The collaborative principles and developed consolidation model can be a useful reference for similar applications.
Introduction

Due to escalating global competition and a decline in profit margins, most multinational corporations pursue global sourcing through a global supply chain (GSC) in order to secure market share and improve profits. The practice of e-commerce and the business trend of mass customization force both manufacturers and retailers to shorten cycle time by managing GSCs more effectively. Successful applications of GSCs, such as that by Dell Computer, have been widely discussed and publicized in the supply chain literature. However, the physical distribution of GSC execution is recognized as its weakest link and can result in inefficient and unreliable product delivery. The collaborative integration with global third-party logistics (3PL) to execute physical distribution dictates the success of any GSC application.

This chapter introduces a new shipper-carrier partnership strategy — collaborative transportation management (CTM) — as an application of GSC physical distribution. CTM is a new business model that includes the carrier as a strategic partner for information sharing and collaboration in a supply chain. Traditional international air transportation by consolidated freight takes eight to 14 days, excluding manufacturing lead time. An integrated global 3PL provider can act as a virtual distributor, allowing GSC participants to compress the delivery cycle time to two to four days.

The application of CTM promises to reduce transit times and total costs for the retailer and its suppliers while increasing asset utilization for the carriers. In an overall effort to minimize the system-wide cost, a global 3PL provider can apply various consolidation policies to maximize the utilization of capital-intensive transportation fleets, such as aircraft. Freight consolidation has received considerable attention in recent years, but the application of consolidation policies by an integrated global 3PL provider under an e-business model is rarely discussed. The trend of mass customization has challenged integrated logistics providers to adjust their consolidation policies in order to simultaneously minimize cost and fulfill service commitments.

This chapter examines a special class of freight consolidation at an integrated global 3PL provider that applies CTM when conducting business with its GSC partners. A mathematical programming model has been developed to assist with consolidation policy evaluation. The computational results reveal a substantial cost savings and a service level improvement of about 20% as a consequence of implementing a collaborative consolidation policy. Several managerial implications and benefits occurring after the global 3PL provider initiated the CTM business model with its business partners are discussed.
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