

E-Commerce Drop shipping: Building a CPG Supply Chain

by

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Abstract

Manufacturers and retailers are increasingly interested in exploring different ways to optimize their fulfillment of e-Commerce orders. An approach that is often considered is drop-shipping, where the manufacturer takes on the responsibility of shipping directly to the consumer. Retailers are interested in this model as it shifts their inventory responsibility upstream and frees up working capital. Manufacturers are intrigued by drop shipping as a means of capturing lost sales on high-value, seasonal products that retailers might be under-stocking. These manufacturers currently lack the retailer-side inventory availability information to assess the extent of this opportunity. We propose a framework to show manufacturers and retailers how to examine the key issues of drop shipping such as capacity constraints, per unit distribution cost, changes in working capital, cost allocations in the supply chain and delivery time to customers. We also explore how to bridge information gaps to gauge inventory availability and lost sales using Web Extraction System data. We demonstrate our framework by partnering with a CPG manufacturer interested in implementing drop-shipping. Using their data from an existing facility and a selected retailer, we simulate drop shipping orders for a specific set of products during the holiday season that are normally fulfilled by the retailer. Firstly we show that in this scenario, the manufacturer will not exceed their current facility's capacity and will require minimal changes to their existing operations. Using Activity-Based Costing (ABC), we then find that the overall channel costs are only slightly more expensive than those in the traditional model. However, the manufacturer takes on a much larger portion of those costs than they would in the existing model. The transfer of the distribution labor and inventory holding costs from the retailer to the manufacturer drives these cost shifts. As expected, we found significant working capital benefits for the retailer when shifting to drop-shipping. To understand the potential gains that could be achieved from capturing lost sales, we paired data from a Web Extraction System with Point-of-Sale data to obtain previously unavailable retailer inventory information. Contrary to initial expectations for this scenario, the retailer displays very high inventory availability, making lost sales a weak justification for adopting this model. Lastly, using publicly available time-in-transit tables, we model the changes in delivery time that customers experience. The results show that the average delivery time increases by one day for most locations in the US. Our framework and analyses contribute to developing an understanding of the opportunities and implications of drop shipping. In addition, we introduce new techniques manufacturers can use to deal with asymmetric inventory information.

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