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Management Insights

Operations Management's Next Source of Galvanizing Energy?
Robert H. Hayes

Many companies today face challenging, poorly understood problems associated with operating within complex supply chains and other collaborations involving several organizations. Although academics and managers have long been studying and operating within such networks, up to now, most of these efforts have focused on trying to determine how a given company can successfully communicate and coordinate with only its direct network partners. What has been lacking, as a result, is a deep understanding of how *several* different members of the network simultaneously interact and influence one another, both directly and indirectly. Such understanding might be achieved by having teams, composed of academics and practitioners working together, simultaneously study the operations of several entities within such a network. Through such joint research we can gain a clearer understanding of how and why the whole network behaves as it does, the trade-offs that can be made, and how it might be coordinated more effectively. Such multiteam studies would both provide new managerial insights into these pressing problems and be a source of renewed energy and creativity for the whole field of operations management.

Drivers and Enablers That Foster Environmental Management Capabilities in Small- and Medium-Sized Suppliers in Supply Chains
Su-Yol Lee, Robert D. Klassen

Pressures to improve the environmental greenness of products spread both upstream and downstream throughout supply chains. However, the limited capabilities and resources available within many small- and medium-sized enterprises (SME suppliers) frequently hamper an effective response to these pressures, which in turn hurts larger, more sophisticated buying firms (i.e., industrial customers). After examining multiple SME suppliers of two large customers, the authors identified and mapped factors that initiated and improved environmental capabilities in SME suppliers over time. In many SME suppliers, large buyers were critical for initiating, and then further enabling, the improvement of suppliers' environmental capabilities. Thus, two key program areas emerged: customers' monitoring of suppliers, and then customers supporting their further development. Moreover, an internal champion of environmental concerns within an SME also provided the impetus for the suppliers to acquire needed external expertise, such as from government agencies. Overall, synergistic linkages emerged between supportive customers, the availability of public resources, and the development of green capabilities in SME suppliers. When these findings are combined with earlier research on large suppliers, an integrative framework emerges that highlights key differences in how SMEs might be stimulated to contribute to greener supply chains.

Product Portfolio Strategies: The Case of Multifunction Products
Yuwen Chen, Asoo J. Vakharia, Aydın Alptekinoğlu

Motivated by the proliferation of multifunction products, especially in the electronic markets (e.g., cell phone-PDA; cell phone-digital camera; iPod phone), the authors investigate product portfolio decisions of a single firm by analyzing the impact of three major factors: substitution or cannibalization effects, variable manufacturing costs, and product pricing decisions. They use an economic model to characterize the firm's optimal product portfolio (through a quantity-based decision), which in turn determines the market equilibrium prices for each product. Some of the unique insights stemming from of our analysis are (a) the optimal product portfolio choice is driven primarily by maximum profit margins for the single-function products *weighted* by the demand substitution effects; and (b) the complete functionality of the base single-function product is always included in the optimal product offering, but this is not necessarily the case with the complete functionality of the non-base single-function product.

Order Progress Information: Improved Dynamic Emergency Ordering Policies
Gary M. Gaukler, Özalp Özer, Warren H. Hausman

Technologies such as radio-frequency identification and global positioning system can provide improved

real-time tracking information of products and replenishment orders along the supply chain. The authors call this type of visibility *order progress information*. By modeling a retailer facing an uncertain lead time for order fulfillment as part of a global supply chain, the authors investigate how order progress information can be used to improve inventory replenishment decisions. They characterize a replenishment policy that allows for releasing emergency orders in response to the order progress information and evaluate the cost savings due to this improved replenishment policy. As a result, they are able to quantify the value of supply chain visibility in such a setting.

Value of Sharing Production Yield Information in a Serial Supply Chain
Hyun-cheol Paul Choi, James D. Blocher, Srinagesh Gavirneni

Information has been recently recognized as a prominent driver of supply chain performance, and there is increased interest in figuring out how to incorporate the available information in day-to-day decision making. It is also important to figure out when and which information is useful and by how much. Such a quantification of the benefits of information sharing can be useful in figuring out the return on investment of prospective implementations of information technology. Using a two-stage supply chain with random production yields at the supplier as the backdrop, the authors formulate and analyze inventory control problems that incorporate various levels of information sharing. After proposing efficient solution methods for these models, they compute the benefit of information and study how these benefits change with respect to various supply chain parameters. They observed that information is most beneficial when the variability in supplier yield is high and the variance of end-customer demands is low. The benefits were rather robust to changes to the ratio of penalty cost to holding cost.

On the Benefits of Assortment-Based Cooperation Among Independent Producers
Yalçın Akçay, Barış Tan

The authors consider a competitive market for a set of substitutable products, focusing on the challenges small- to medium-size companies face in export-oriented industries. They study the cooperation of independent producers who agree to offer a combined set of products to their customers. Under this so-called assortment-based cooperation arrangement, producers use discounted price contracts to manage the exchange of products and funds among themselves. The authors propose an analytical model that enables us to determine the characteristics of firms and their products that would facilitate a beneficial cooperation. They conclude that cooperation between single-product firms with identical characteristics is always beneficial, whereas such an assortment-based cooperation scheme might not be beneficial for firms which are significantly different from one another. They further show that commonality in product assortments of cooperating firms has adverse effects on the benefit from cooperation. An optimization-based method can determine the group of firms that would benefit from cooperation in a market and identify the contract parameters for profit sharing.

Optimal Contract Design for Mixed Channels Under Information Asymmetry
Samar K. Mukhopadhyay, Xiaowei Zhu, Xiaohang Yue

For a manufacturer, adding a direct channel to the customer makes an attractive business model, but it makes the manufacturer a competitor for other channel partners, such as the retailer. The resulting channel conflict can be detrimental to business. To alleviate this channel conflict, the authors found that manufacturers should allow retailers to add value to the manufacturer's product before selling to the final customers, making the retailer's product a differentiated product. Note that if retailers sell more, they will buy more from the manufacturer. The authors also found that manufacturers should allow the retailers to set their own price, and manufacturers should design an appropriate contract, even when the retailers' cost structure information is not available to the manufacturer. The manufacturer's pricing will not be affected due to this lack of information but its profit will be, so manufacturers should offer appropriate monetary incentive to obtain this information.