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ACCEPTED MANUSCRIPT

COMPARISON OF INTEGRATED AND LOCAL PLANNING APPROACHES FOR THE SUPPLY NETWORK OF A GLOBALLY-DISPERSED ENTERPRISE

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ABSTRACT

While there is large number of insightful works on supply chain integration, the integration and coordination of supply chain activities in manufacturing networks of global enterprises received little attention. This study aims to assess and quantify the impact of integrated planning and decision making for the geographically extended supply network of a global manufacturer in terms of cost and service performance under demand uncertainty. Mixed Integer Programming (MIP) is used to model the hierarchical structure of tactical and operational planning; simulation is used to model the supply chain operations under uncertainty; and a full factorial design is used to examine the relationships among experimental factors. The results indicate that integration leads to improved cost and customer service performance, simultaneously, and that the higher the level of demand uncertainty, the greater are the benefits to be gained from integration. Furthermore, integration of planning and decision making across the supply network reduces the need for safety stocks, i.e., the preferred overall level of customer service performance is maintained with less investment in inventory.

Key Words: Supply Chain Integration, Global Supply Networks, Mathematical Modeling, Simulation.

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