

Shang, Jen S.; Li, Shanling; Tadikamalla, Pandu

Operational design of a supply chain system using the Taguchi method, response surface methodology, simulation, and optimization. (English) Zbl 1060.90048

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Summary: Managing a supply chain to meet an organization's objectives is a challenge to many firms. It involves collaboration in multiple dimensions, such as cooperation, information sharing, and capacity planning. In this research, we focus on identifying the 'best' operating conditions for a supply chain. We propose a hybrid approach that incorporates simulation, Taguchi techniques, and response surface methodology to examine the interactions among the factors, and to search for the combination of factor levels throughout the supply chain to achieve the 'optimal' performance. This study makes it possible for firms to understand the dynamic relations among various factors, and provides guidelines for management to minimize the impact of demand uncertainty on the performance of the supply chain. The results help the manufacturer determine the proper plant capacity and adopt the right level of delayed differentiation strategy for its products. We also quantify the potential gains of cooperation among different members of the supply chain. Using such knowledge, a manufacturer can develop an appropriate incentive plan to motivate the retailers and suppliers to collaborate, and to realize the potential of the entire supply chain.

MSC:

90B35 Deterministic scheduling theory in operations research
90B30 Production models

Cited in 7 Documents

Full Text: [DOI](#)

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