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MODELLING THE COORDINATED SUPPLY CHAIN NETWORK

(Pemodelan Rangkaian Rantaian Bekalan Terkoordinasi)

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ABSTRACT

A supply chain is a network of suppliers, manufactures, distributors and retailers that deliver finished products to the end customers. The configuration of the manufacturing and distribution facilities, and selection of distribution channels are typical strategic supply chain decisions. In this paper we consider the problem of reconfiguring the supply chain network to significantly improve customer service levels and reduce system wide cost. For this purpose we develop a mathematical model that can help in the integrated design of strategic supply chain networks and the determination of tactical production-inventory decisions. In this model, inventory and production cycles are assumed synchronised across the entire supply chain. Then we describe an optimal solution procedure for solving the model and present a numerical example for illustrating the model. The numerical results show that the network configuration under integer multipliers coordination mechanism will result in lower total cost.

Keywords: supply chain; production-inventory decisions; optimisation

ABSTRAK

Rantaian bekalan merupakan rangkaian pembekal, pengilang, pengedar dan peruncit yang memberikan produk siap kepada pelanggan akhir. Tatarajah kemudahan pembuatan dan pengedaran, dan pemilihan saluran pengedaran ialah strategi yang lumrah pemutusan rantai bekalan. Dalam makalah ini kami pertimbangkan masalah tatarajah semula rangkaian rantaian bekalan untuk mempertingkatkan dengan sebaiknya tahap perkhidmatan pelanggan dan mengurangkan kos sistem yang luas. Untuk tujuan ini kami membangunkan model matematik yang dapat membantu reka bentuk bersepadu rangkaian rantaian bekalan strategik dan penentuan pemutusan pengeluaran-inventori taktikal. Dalam model ini, inventori dan kitaran pengeluaran diandaikan sejajar pada keseluruhan rantai bekalan. Setelah itu kami menjelaskan tatacara penyelesaian optimum untuk menyelesaikan model tersebut dan memberikan contoh berangka untuk menggambarkan model itu. Keputusan berangka menunjukkan bahawa tatarajah rangkaian melalui mekanisme koordinasi pendarab integer menghasilkan jumlah keseluruhan kos yang lebih rendah.

Kata kunci: rantaian bekalan; pemutusan pengeluaran-inventori; pengoptimuman

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