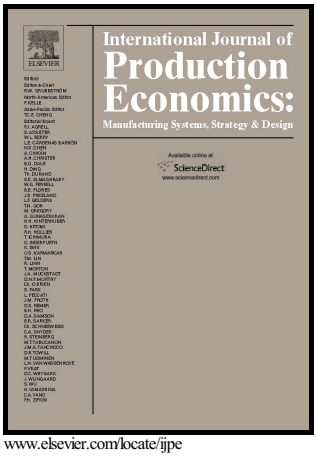

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A Robust Optimization Model for Cellular Manufacturing System into Supply Chain Management

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Abstract

In this article, a new mathematical model is presented for a cellular manufacturing system into supply chain design with labor assignment. This paper considers important manufacturing features thoroughly such as multiple plant locations, multi-market allocations with production planning and various part mix. The proposed model aims at minimizing the total cost of holding, inter-cell material handling, external transportation, fixed cost for producing each part in each plant, machine and labor salaries. It is assumed that the demands of products are uncertainty in three scenarios: optimistic, pessimistic and normal. Also, a robust optimization approach is then developed to solve the proposed model and find the best solution. The robustness and performance of the proposed model are explained in terms of an industrial case from a typical equipment manufacturer. This case study provides the researchers and practitioners to better understand the importance of designing robust optimization and cell formation in the supply chain management from a practical point of view.

Keywords: Cellular Manufacturing, Supply Chain, Labor assignment, Robust Optimization, Market allocation.

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