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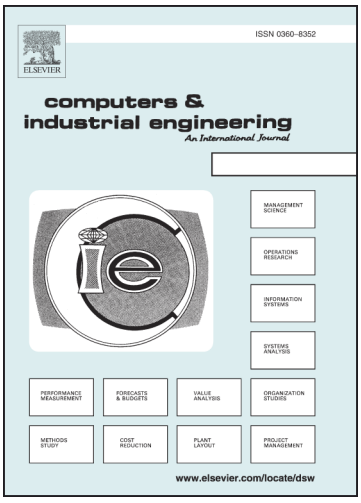

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Combining variable neighborhood search with simulation for the inventory routing problem with stochastic demands and stock-outs

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Abstract

Vendor managed inventory aims at reducing supply chain costs by centralizing inventory management and vehicle routing decisions. This integrated supply chain approach results in a complex combinatorial optimization problem known as the inventory routing problem (IRP). This paper presents a variable neighborhood search metaheuristic hybridized with simulation to solve the IRP under demand uncertainty. Our simheuristic approach is able to solve large sized instances for the single period IRP with stochastic demands and stock-outs in very short computing times. A range of experiments underline the algorithm's competitiveness compared to previously used heuristic approaches. The results are analyzed in order to provide closer managerial insights.

Keywords: Variable neighborhood search, metaheuristics, simheuristics, inventory routing, stochastic demands.

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