A NEW HEURISTIC FOR INVENTORY ROUTING PROBLEM WITH BACKLOG

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ABSTRACT
Inventory routing problem (IRP) is a major concern in operation management of a supply chain. The aim is to integrate the transportation activities and inventory management along the supply chain and avoid inefficiencies caused by solving the underlying vehicle routing and inventory sub-problems separately. This paper can be considered as an extension of single depot IRP with order backlogs to a multidepot case. We develop a mixed integer mathematical model for multi-depot inventory routing problems allowing order backlogs. The mathematical model is used to find the best compromise among transportation, holding and backlog costs for small instances. A novel method based on Simulated Annealing (SA) is proposed to solve larger IRPs with multiple depots. Computational results for single depot problems are compared with those reported in a recent article with similar assumptions. We have extended the proposed SA algorithm for solving multi-depot IRPs with the possibility of order backlogging. Since we could not find any reported computational results for this type of multi-depot problems; we have compared the results with exact solutions obtained by Cplex solver.