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A HEURISTIC APPROACH TO SUPPLY CHAIN NETWORK DESIGN FOR A TIRE INDUSTRY IN BRAZIL

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Abstract:

In this paper, we presented an integer linear programming model to address the problem of reorganizing logistics network for a company that produces products rubber-based. First as a significant contribution to the papers, we conducted a detailed description of rounding heuristics designed for the problem. The need to reorganize the logistics network is motivated by the decision to build a new manufacturing plant in Brazil. The mathematical model was based on an unusual business strategy that a customer belonging to an area of demand can be supplied by more than one distribution center. Linear programming (LP) base rounding is an important heuristic method. Recently, some new types of rounding methods have been proposed, such as diving method. There exist two types of integer variables in this problem: the first type corresponds to determining warehouse locations, while the second type corresponds to assigning customers to warehouses. The study used an arc-based formulation to determine the set of distribution centers with lower operating costs that must be opened to meet the demand areas, the amount of each commodity to be purchased from suppliers and the quantity of each product to be produced at each plant. The computational implementation is developed in two stages: The first stage used a rounding method that allows good initial solution to the problem. In the second stage, a local search algorithm that minimizes operational cost the open distribution center was applied. The main contribution of the paper is to provide managers with a tool to support the logistic decision making process using optimization techniques.