

OPTIMIZATION OF A MULTIPLE-VENDOR SINGLE BUYER FUZZY INTEGRATED INVENTORY MODEL WITH A VARIABLE NUMBER OF VENDORS

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Abstract

Supply chain management is concerned with the coordination of material and information flows in multi-stage production systems. Inventory management has long been treated as an isolated function solely focused on individual entities, taking into account concerned with single-vendor-single-buyer and single-vendor-multiple-buyer-models. Concerning the supplier selection problem, quantitative models mainly focus on the questions of which vendors to select and how to allocate the order quantity to the suppliers. Since we consider a lotsize problem in this paper, we will only review supplier solution models that take the lotsize decision and corresponding costs such as ordering costs or inventory carrying charges, explicitly into account. Considering the selection of suppliers in production planning gives the manufacturing system additional flexibility to react to changes in its environment and may lead to planning results that help to increase the competitiveness of the whole supply chain. To close this gap, this article develops an integrated inventory model which considers supplier selection. In this model we consider the fuzzy total cost under crisp order quantity or fuzzy order quantity in order to extend the traditional inventory model to the fuzzy environment. We use Function Principle as arithmetic operations of fuzzy total cost and use the Graded Mean Integration Representation Method to defuzzify the fuzzy total cost. Then we use the Kuhn-Tucker method to find the optimal order quantity of the fuzzy order inventory model.

Key Words : *Inventory control, Supplier selection, Integrated inventory, Fuzzy inventory, Order quantity, Function principle, Graded Mean Integration Representation, The total inventory cost, Optimization, Kuhn-Tucker Method.*

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