

A two-echelon inventory model with fuzzy annual demand in a supply chain

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Abstract

It requires a new spirit of cooperation between the buyer and the vendor in supply chain environment today. A two-echelon inventory model with such consideration is based on the total cost optimization under a common stock strategy and business formula. However, the supposition of known annual demand in most related publications may not be realistic. This paper proposes the inclusion of fuzzy annual demand and then employs the signed distance, to find the estimation of the common total cost in the fuzzy sense, and derives the corresponding optimal buyer's quantity consequently and the integer number of lots in which the items are delivered from the vendor to the purchaser. Numerical example is included to illustrate the procedures of the solution.

Keywords : Supply chain, inventory, signed distance.

1. Introduction

In the current supply chain management environment, JIT requires cooperation between the buyer and the vendor, and it has shown that forming a partnership between the buyer and the vendor is helpful in achieving tangible benefits for both parties Kelle *et al.*[1]. Many researchers have demonstrated that buyers and vendors can both obtain greater benefit through strategic collaboration with each other Stefan *et al.* [2].

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Journal of Information & Optimization Sciences

Vol. 27 (2006), No. 3, pp. 537-550

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0252-2667/06 \$2.00 + 0.25