A Study of an Enhanced Simulation Model for TOC Supply Chain Replenishment System under Capacity Constraint

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Abstract

The Theory of Constraints-supply chain replenishment system (TOC-SCRS) is a replenishment method of the TOC supply chain solution and now being implemented by a growing number of companies. The performance reported by the implemented companies includes reduction of inventory level, lead-time and transportation costs and increasing forecast accuracy and customer service levels. However, when the TOC-SCRS is applied in a plant or a central warehouse, the determination of reliable replenishment time will encounter a conflict with the replenishment quantity, especially under the constraint of limited factory capacity. An enhanced simulation replenishment model for TOC-SCRS under capacity constraint is then developed. A numeric example and a sensitivity analysis are utilized to evaluate the application of the proposed model. Employing this proposed methodology will facilitate a plant or a central warehouse to successfully implement an effective TOC-SCRS.

Keyword：Supply chain management,Inventory replenishment,Theory of constraints (TOC),TOC supply chain replenishment system