

Minimizing due date assignment, holding, distribution costs and maximum tardiness in supply chain

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Abstract

In this paper, four of decisions that are effective in production systems, are modeled concurrently: due date assignment, production scheduling, holding cost and outbound distribution scheduling. These four decisions are made in the market, production system, transport scheduling and storehouse. In the present paper, we study minimizing total costs that includes maximum tardiness, due date assignment, delivery and holding cost on a single machine for multi-customer. Mixed Integer Non-Linear programming (MINLP) and a Mixed Integer Programming (MIP) are applied for the solution. This problem is NP-hard, thus Multi-Objective Particle Swarm Optimization algorithm (MOPSO), is used for solution of large-scale instances. This paper is the first time that has considered holding costs and has been used MOPSO algorithm for finding optimal solution. The computational results showed MOPSO algorithm has good performance.

Key words: Supply chain scheduling, due date assignment, holding costs, multi-objective Particle Swarm Optimization.

1. Introduction

Supply chain management is one of the most important issues that both theory and practical aspect are considered by researchers for many years. Specifically, the Integrated production and distribution scheduling is one the most important issue which are dedicated more researches to them after presentation of hall and pots article's in 2003.

Sales planning (due date assignment), production scheduling, and distribution scheduling are decisions which should be coordinated in Integrated due date assignment, production and distribution scheduling problem. Defining due date assignment is important, because of lengthy due dates and short due dates. Sequencing of jobs, assigning jobs to machine and machine scheduling are considered in production systems, but most of these systems do not consider delivery issues and distribution. Transportation system scheduling and delivery scheduling affect the profitability of producers.