

A Multi-Criteria Model for Scheduling of Stochastic Single Machine Problem with Outsourcing and Solving It through Application of Chance Constrained

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Abstract : This paper presents a new multi-criteria stochastic mathematical model for a single machine scheduling with outsourcing allowed. There are multiple jobs processing in batch. For each batch, all of job or a quantity of it can be outsourced. The jobs have stochastic processing time and lead time and deterministic due dates arrive randomly. Because of the stochastic inherent of processing time and lead time, we use the chance constrained programming for modeling the problem. First, the problem is formulated in form of stochastic programming and then prepared in a form of deterministic mixed integer linear programming. The objectives are considered in the model to minimize the maximum tardiness and outsourcing cost simultaneously. Several procedures have been developed to deal with the multi-criteria problem. In this paper, we utilize the concept of satisfaction functions to increases the manager's preference. The proposed approach is tested on instances where the random variables are normally distributed.

Keywords : single machine scheduling, multi-criteria mathematical model, outsourcing strategy, uncertain lead times and processing times, chance constrained programming, satisfaction function

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