Solving flexible job-shop scheduling problem with transfer batches, setup times and multiple resources in apparel industry

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Abstract

Apparel industry is characterized by the presence of flexible job-shop systems that have been structured to manufacture a wide range of customized products. However, Flexible Job-shop Scheduling is really chal-lenging and even more complex when setup times, transfer batches and multiple resources are added. In this paper, we present an application of dispatching algorithm for the Flexible Job-shop Scheduling Problem (FJSP) presented in this industry. Days of delay, throughput, earlier date and monthly demand are used as rules of operation selection. A case study in apparel industry is shown to prove the validity of the proposed framework. Results evidence that this approach outperforms the company solution and other algorithms (PGDHS and HHS/LNS) upon reducing average tardiness by 61.1%, 2.63% and 1.77% respectively. The inclusion of throughput in the model resulted in low tardiness for orders with high speed to make money. Promising directions for future research are also proposed.

Keywords