A SIMULATION/OPTIMIZATION ALGORITHM FOR AN FMS DISPATCHING PRIORITY PROBLEM

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ABSTRACT

The efficient use of capital intensive FMS requires determination of effective dispatching priority with which the parts of the selected part types are to be inputed into the system. This paper presents a simulation-optimization approach to find an appropriate dispatching priority. The study is based on a detailed simulator for a module-type commercial FMS. Specifically, after presenting the basic configuration and fundamental control logic of the system together with its main characteristics as a special type of a job shop, an algorithm is presented which combines simulated annealing and simulation to explore a dispatching priority of operations that minimizes the total tardiness. Computational performance of the algorithm shows that good solutions can be obtained within a reasonable amount of computations. The paper also compares the performance of the "optimal" or near optimal dispatching priority generated by the proposed algorithm with those generated by standard dispatching rules such as SPT, EDD and SLACK.

KEY WORDS

Flexible Manufacturing Systems, Simulation-Optimization, Dispatching Priority, Simulated Annealing.