

Vertical Scheduling Approach to Dynamic Scheduling Problems Using Tabu Search

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In recent years, there have been significant advances in the theory and the application of Meta-Heuristics to solve hard optimization problems. Most of the heuristic or approximation methods proposed for Job-Shop Scheduling problems are tailored techniques, i.e. developed specifically for a problem in consideration. There is a need to develop robust and flexible methods capable of being applicable not only to a specific problem and environment but also to a variety of scheduling problems and environments.

Most research in scheduling focuses on optimization of static and dynamic deterministic problems where all problem data are known before scheduling starts. However real-world optimization problems tend to be complex and non-deterministic.

This paper presents a simple and general framework based on Tabu Search to solve Job-Shop like scheduling problems. The framework uses a Resource-Oriented approach to scheduling. Moreover, it is concerned with integrated scheduling of jobs which are products made of several parts which may be submitted to a number of manufacturing multi-level assembly operations.

Some computational tests were performed in order to evaluate the performance of the proposed TS based framework. The results were, in general, as good as, and for some measures better than, those obtained through the Shifting Bottleneck method.

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