**عنوان مقاله:**

A Mathematical Optimization Model for Integrating the Problems of Discrete Time-Cost Tradeoff (DTCTP) and Multi-Mode Resource-Constrained Project Scheduling (MRCPSP)

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**خلاصه مقاله:**

The problem of resource-constrained project scheduling(RCPSP) and the problem of time-cost tradeoff (DTCTP) are two mathematical optimization problems that have long mattered in project management in such a way that reducing the completion time of a project, which is achieved through increasing the resources required for executing the activities, usually turns into a necessity in practice. The existing methods and algorithms for solving this problem, considering the cost-slope of the activities as a pivotal index, have been defined differently to date. Yet, this paper aims to present a framework whereby project scheduling and time-cost tradeoff can be addressed under the circumstances that several modes of execution exist for each activity. Apart from the renewable resources, the non-renewable resources have also been taken into consideration for each activity. Hence, initially, a mathematical optimization model based on the assumptions of the problems is proposed, and then, via changing the variables and other mathematical modelling techniques, the problems are integrated and developed in form of a mixed-integer linear mathematical programming model. Eventually, the model is solved using the branch and bound method and the results are studied with sensitivity analysis.

**کلمات کلیدی:**
MRCPSP, DTCTP, Optimization

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