

EXPANDING FINANCE-BASED SCHEDULING TO DEVISE OVERALL-OPTIMIZED PROJECT SCHEDULES

ABSTRACT:

Construction contractors often finance projects using bank credit lines that allow contractors withdraw money up to certain credit limits. Finance-based scheduling provides schedules that ensure that the contractor's indebtedness at any time during the construction stage doesn't exceed the credit limits. Generally, constricted credit limits tend to yield prolonged schedules. Provided that credit limits can be adequately relaxed, compressed schedules of compressed-duration activities can be attained. Devising a compressed schedule calls for the incorporation of Time-Cost Trade-off (TCT) analysis to strike a balance between the decreased overhead costs and the increased direct costs of the activities. Since employing TCT analysis usually causes great fluctuations in the daily resource requirements by mixing compressed-duration activities of high resource demand with others of low resource demand, therefore, the need for resource management techniques becomes inevitable to ensure efficient utilization of resources. This paper used genetic algorithms to expand finance-based scheduling to devise schedules for relaxed credit limits. A prototype system was developed and coded using Visual Basic, then, demonstrated using a 5-activity example project. The prototype was validated by comparing the results with those obtained by using the integer programming. Expanding finance-based scheduling to handle the whole spectrum of credit limits helps devise overall-optimized schedules that consider cash, time, cost, and resources.
