

FINANCE-BASED SCHEDULING OF MULTIPLE CONSTRUCTION PROJECTS

1. ABSTRACT

The minimization of total project duration has been the concept underlying CPM/PERT construction scheduling techniques. Subsequently, techniques including resource management and time-cost trade-off analysis were developed to customize CPM/PERT in order to fulfill users' concerns regarding project resources, cost, and time. Financing construction activities throughout the course of the project is another crucial concern that must be properly treated otherwise, non-executable schedules are possibly rendered. Unless contractors manage to procure adequate cash to keep construction work run according to schedule, the pace of work will definitely be relaxed. Contractors procure cash through establishing credit-line accounts with bankers who allow contractors to withdraw cash up to certain credit limits. Finance-based scheduling helps make the expenditures of the project scheduled activities always in balance with the available cash. However, contractors deal with the financing issue at the corporate level rather than at project level. They consider financing as an aspect of the business management rather than of project management. Accordingly, contractors establish credit-line accounts to procure fund for all ongoing projects not for individual projects. This prevailing practice in construction makes the financial management of multiple projects being implemented simultaneously an inevitable demand. This proposal employs multi-objective optimization techniques to devise a set of optimum finance-based schedules. In addition, a fuzzy based technique will be developed and implemented to select the best compromise schedule.