

Quantity Oriented Resource Allocation Strategy on Multiple Resources Projects under Stochastic Conditions [★]

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Abstract

Previous developments from the first author and other researchers were made on devising models for the total cost optimization of projects described by activity networks under stochastic conditions. Those models only covered the single resource case.

The present paper will discuss the case of multiple resources. More precisely, we introduce a strategy of allocation of those resources in order to minimize the waste arising from their latent idleness on their consumption within the same activity. On this strategy we elect one resource as “pivot” and write equations that describe all the quantities for the other resources, on the same activity.

Key words: Project Management and Scheduling, Stochastic Activity Networks, Resource Allocation, Multiple Resources

List of Acronyms

RCPSp: *Resource Constraint Project Scheduling Problem*
AoA: *Activity-on-Arc*
DP: *Dynamic Programming*
EMA: *Electromagnetic Algorithm*

EVA: *Evolutionary Algorithm*
SRPCO: *Single Resource Project Cost Optimization*
MRPCO: *Multiple Resources Project Cost Optimization*
QORAS: *Quantity Oriented Resource Allocation Strategy*
WBRAS: *Waste Balance Resource Allocation Strategy*

1 Introduction

This paper follows the researches made by several contributors starting from the first research made by the first author (see [1]). Those works address a RCPSp (*Resource Constraint Project Scheduling Problem*) where we want to minimize the total project cost involving multimodal activities under stochastic conditions. More precisely, given an project on its planning phase, where all its activities and related requirements are established, we want to determine which is the optimal allocation of resources. This

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