Handling the Uncertainty in Resource Managment

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The duration time of activities of projects cannot very often be estimated correctly in real life. Especially in research and development programs where the duration time of activities is very slightly known and the ex ante and ex post duration times are often different. [1]

In the paper a method is introduced that can determine an optimal resource allocation with minimal total cost from a feasible solution when a target function is given. The duration time, demand of resources and cost of activities can either be deterministic or stochastic.

A new algorithm is introduced by which an optimal resource allocation with minimal total cost for any arbitrary project could be determined. This algorithm could hopefully be widely used in project management, resource planning and in the methodology of small-scale series production management.

The new method schedules the activities in the alternative paths of an admissible resource allocation satisfying a given target function and taking into account that the duration times of the activities are probability variables with an expected value and standard deviation [3],[4]. According to former studies 10- 12% cost can be saved if the duration times of activities are handled as probability variables instead of deterministic values, hence the uncertainty of duration times can be managed and the total project time can approximately be determined if a significance level is given. After all, the total project time is many times influenced by unanticipated events. In case the resources and the duration time of activities are changing at projects in progress, a new resource allocation for the running activities and for those still not started can be determined with this method.

If the uncertainty of the major variables (duration times, cost and resources) is taken into account when scheduling and allocating a project, then the duration times, costs, and resources can be estimated more accurately. Therefore the total project time, total cost and total demands on resources can be determined more accurately, too.

References

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