

Realized Value Optimization in Product Development Post-certification

Enterprise

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References

Two articles on this topic are available on the problems page and can be downloaded.

Abstract

In many regulated sectors, Product Development (PD) efforts usually proceed through distinct pre-determined phases towards a key milestone represented by the granting of certification from regulatory authorities. Although much effort is spent on timely delivery of quality product within budgetary constraints in the pre-certification phase (through approaches such as project management and systems engineering), it is not unusual for further engineering resources to be expended in the post-certification phase.

Recently a taxonomy of post-certification engineering activities was developed at Pratt & Whitney Canada, and a proposal was put forward for a job based multi-criteria value index to enhance decision making associated with resource allocation to jobs. The present project consists of developing a mathematical approach and a model that will support optimal allocation of jobs and tasks to resources during the quarterly engineering planning cycles (OMM) for non completed and non pre-certification design value stream activities. A job corresponds to a set of activities to be undertaken by one or more resources and to be incorporated into a unique engineering change (EC) in a bill of materials (BOM). A task may consist of multiple jobs within a unique work breakdown structure (WBS) for a given engine project.

Ideally the proposed model will include a multi-year planning horizon broken down into quarterly periods. Model performance should be evaluated from the point of view of realized value, as well as from a throughput standpoint. Job value indices are currently computed using arbitrarily defined weights; an approach to help define the best set of criteria weights would be appreciated.

Constraints that must be taken into account include limited program budgets and limited supply of organizational breakdown structures (OBS). Realistic industrial case study data (based on the current quarterly planning

cycle) will be provided. These data have the following features: a demand exceeding the capacity, a dozen post-certification programs for over 1000 post-certification jobs, close to 500 WBS, and more than two dozen OBS. The data will include the number of actual hours (A), the estimated time to completion (ETC), the due date (D), the job to project relationship (P), the program post-certification budget (B) for year 1, the OBS capacity (C) for year 1, and the job value index (V) derived from the job attributes levels (AL), for each job.