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WORKING PAPER

On the dynamic use of project performance and schedule risk information during project tracking

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ABSTRACT

Project scheduling, risk analysis and project tracking are key parameters to a project's success or failure. Research on the relative sensitivity of project activities during the project scheduling phase as well as research on project performance measurement during project progress have been published throughout the academic literature and the popular press. Obviously, the interest in activity sensitivity in- formation and project performance measurement from both the academics and the practitioners lies in the need to focus a project manager's attention on those activities that influence the performance of the project. When management has knowledge about the current project performance and has a certain feeling of the relative sensitivity of the various project activities on the project objective, a better management focus and a more accurate response during project tracking should positively con- tribute to the overall performance of the project.

In this article, two alternative project tracking methods to detect project problems are presented and their efficiency on the quality of corrective actions to bring the project back on track is measured and evaluated. More precisely, a bottom-up and a top-down project tracking approach within a corrective action framework is applied on a large and diverse set of fictitious projects that are subject to Monte- Carlo simulations to simulate fictitious project progress under uncertainty. The top-down tracking approach relies on state-of-the-art earned value management performance metrics, while the bottom-up tracking mechanism makes use of the well-known schedule risk analysis method.

A computational experiment shows that a top-down project tracking approach is highly efficient for project networks with a serial activity structure while a bottom- up approach performs better in a parallel structured project network. Moreover, it will also be shown that dynamic thresholds to trigger corrective actions, which gradually increase or decrease the project manager's attention along the project progress, outperform the static thresholds for both tracking approaches.