HOW USEFUL ARE MATHEMATICAL MODELS AND METHODS?

"I love it when research proves useful"

Models can be useful tools for decision-making. "But people are reluctant to use ones that are too complex or unrealistic. And you can't blame them!" Mario Vanhoucke, Professor at Vlerick Leuven Gent Management School and at Ghent University, is a man with a mission: to improve the usability of mathematical models and methods. He has conducted award-winning research into project performance measurement methods and risk analysis techniques.

Despite, or perhaps because of, the wealth of methods, models and algorithms available, the question remains as to when to use which one. For a project monitoring model to serve its purpose, it would need to accurately predict time and cost to completion as well as support appropriate corrective and preventive action. "Unless these models include the element of uncertainty or risk, they'd provide a solution to a problem that doesn't exist," explains Mario Vanhoucke. "The baseline schedule of a project is a snapshot of what could be, but reality will be different anyway. Consequently, you'd also want a model that supports efficient project tracking, i.e. one that requires minimum time and effort but stimulates an accurate and efficient response in case the project is in jeopardy."

Tips and tricks

Working on a large set of projects, Mario Vanhoucke analysed various methods of project performance measurement – based on earned value measurement (EVM) – and schedule risk analysis (SRA). His research provided profound insight into the static and dynamic drivers of cost and time forecast accuracy and offered a framework to decide which method would be the most reliable to use for a specific project, as well as useful tips and tricks for practitioners.

Mario Vanhoucke: "EVM-based methods typically yield good results for serial projects with many critical activities, whereas SRA-based methods score better for projects with many parallel jobs. Depending on the project characteristics, which may change over time, an intelligent mix of forecasting and monitoring techniques should be used."

Expert system

An expert system was developed as a spin-off from this extensive research. This tool integrates different methods and, based on project characteristics, applies the most adequate mix, presenting the user with only the relevant information to take action. Mario Vanhoucke smiles: "I love it when research proves useful."

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> [Mario Vanhoucke, Professor at Vlerick and Ghent University]

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Discover more about the research and tool referred to in this article at www.protrack.be/protrack_research.php.

Earned value management (EVM)

EVM is a top-down project management technique for monitoring project progress based on the performance indicators cost, time and scope. If an indicator falls outside a predetermined range, the user "drills down" to the activity causing the problem and intervenes.

Want to find out more? Attend the European conference on Earned Value on 24 and 25 November 2010, a joint initiative of Vlerick Leuven Gent Management School and Ghent University.

www.eva-europe.eu

Schedule risk analysis (SRA)

SRA quantifies the uncertainty in a duration estimate that may arise from, for example, changes in the availability of resources, productivity, weather conditions or requirements. SRA is a bottom-up approach in that activities are monitored with regard to their impact on the overall project schedule. Only activities with an impact (percentage of criticality) above a pre-defined threshold need to be monitored.