

## Foreword

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To survive in today's competitive global economy, where product life cycles are shorter and new product development costs are higher, corporations must develop the best and most efficient management methodologies. Project management can provide an organizational paradigm that contributes to firm efficiency and rational resource allocation, bridging the gap between corporate strategy and day-to-day decisions.

Academic research in project management has proposed formal solutions to a wide range of problems. Hoon Kwak and Anbari (2009) studied the evolution of PM research in eight "allied disciplines," analyzing the contributions in 18 top management and business journal publications since the fifties. "Operations research/decision making/operation management" is the second most important project management research subject within top management and business journals, after "Strategy/Project Portfolio Management."

In turn, academic solutions contribute to the practice of project management. This should not surprise us because complexity and uncertainty are common issues in projects, and optimization of project key variables, such as schedule, costs, makespan, etc., contribute to project success.

In practice, most of the contributions of operations research to project management are related mainly to project scheduling, and then to modelling, and evaluation (Tavares 2002). But operations research could contribute to project management in other areas. Indeed, modern approaches in project management emphasize the need to integrate different project dimensions, such as human resources (leadership, motivation, etc.), risk management, procurement, project quality, scope management, monitoring, etc. Both academics and practitioners agree about the importance of defining and managing project complexity and uncertainty, and the need for finding new project evaluation methods, and developing new methodologies to manage project portfolios.

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Under this framework, new problems should be formalized and modeled, and new optimizing solutions should be found. In other words, there are vast new opportunities for operations research to help project managers deal with the complexity of their real projects.

This special section is a collection of papers solicited at the occasion of the First International Construction and Engineering Project Management Workshop (CEPMaW2008), held in 2008 at the University of Valladolid (Spain), although the call for papers was opened to the entire operations research and project management community. Our aim was to gather new contributions to project management from operations research, while not limiting the topic to project scheduling.

Complexity ranks highly among the relevant topics in project management research. In the first paper in the section, Castelon-Limas et al. study linear and artificial neural network models for estimating project complexity using the International Software Benchmarking Standards Group data set.

Project scheduling under resource constraints is another important project management issue. Bartels et al. present a resource-constrained project scheduling approach optimizing the total discounted disbursements of dismantling a nuclear power plant. The model involves minimum and maximum time-lags, renewable and cumulative resources, and multiple activity execution modes. Optimal solutions are obtained using a relaxation based enumeration approach.

Bendavid and Golany introduce a new methodology to schedule project activities with stochastic durations. They employ the so-called cross-entropy methodology to set the activity starting time intervals under the objective of minimizing the sum of expected penalty costs resulting from the deviations from these intervals.

Lambrechts et al. analytically determine the impact of unexpected resource breakdowns on activity durations. Using this information, they develop an approach for inserting time buffers into the project schedule in order to protect it against possible disruptions caused by resource unavailabilities.

Muñoz-Hernández et al. describe a decision-making tool based on the real options project valuation methodology. They show six different case studies to analyze the role of the main model parameters. The methodology improves the classical net present value method in different scenarios.

## References

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