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Controlling Projects

Completing a project on time and within budget is not an easy task. Project monitoring and controlling systems should consist of processes that are performed to observe project progress in such a way that potential problems can be identified in a timely manner. When necessary, corrective actions can be taken to exploit project opportunities or to bring projects in danger back on track. The requisite is that project performance is observed and measured regularly to identify deviations from the project baseline schedule. Therefore, monitoring the progress and performance of projects in progress requires a set of tools and techniques that should ideally be integrated into a single decision support system. The understanding of the basic elements and concepts is a requisite to successfully use and implement the various project control concepts in an integrated project management and control system.

Both professionals and academics have spent a vast amount of effort in developing tools and methods to efficiently and effectively manage and control projects in progress. Initiated by the early efforts in the beginning of the 20th century by Henry Gantt *(Gantt, 1919)*, and the development of the Program Evaluation and Review Technique and Critical Path Method a few decades later, a major milestone was reached in the 60s in the Department of Defense of the US government through the introduction of a toolkit that is now known as Earned Value Management *(EVM)*. Nowadays, a variety of methodologies and software tools are available to integrate project scheduling, risk analysis and project control methods into an integrated system, often referred to in literature as "Dynamic Scheduling" *(Vanhoucke, 2013)* or "Integrated Project Management and Control" *(Vanhoucke, 2014)*.

Earned Value Management achieved enormous success as a project management and control methodology, but its focus was mainly put on cost management, and almost no attention was paid to time management. Even the earned value gurus *(Fleming and Koppelman, 2005)* discuss the topic from a price tag point of view and stress in their well-known Harvard Business Review article *(Fleming and Koppelman, 2003)* that companies rely on some sort of EVM to predict the total project cost in a more accurate way than by simply using straightforward traditional cost accounting methods. This restrictive time focus was mainly due to the idiosyncrasies of the EVM schedule indicators, as they fail to provide reliable indicators in the later stages of projects in progress. This disbelief in EVM's applicability for schedule management was further strengthened by the publication of an alternative technique, known as the Earned Schedule *(ES)* method, in the seminal paper by Lipke *(2003)*. This new technique changed the way schedule indicators are computed by getting rid of their shortcomings and quirky behavior at the final project stages. Not much later, a comparison study by Vandevoorde and Vanhoucke *(2006)* compared this novel ES method with two traditional cost-based EVM methods and concluded that the ES method outperforms the traditional methods for monitoring and predicting the time of projects in progress. This study has been followed by more academic studies published in academic journals *(Vanhoucke, 2011)* and further dissemination of the research has been made possible through the publication of two books by Springer *(Vanhoucke, 2010, 2014)*. The new ES method has been recognized as a valid technique by both the Project Management Institute *(since their adoption of the ES method in the PMBOK)* and the International Project Management Association *(since their recognition of the "Measuring Time" research awarded on the IPMA world congress in 2008)*. Ever since, the academic research on EVM/ES has grown significantly, leading to a wide variety of extensions to manage and monitor the time and cost performance of projects.

One of these research papers was recently written by Khamooshi and Golafshani *(2014)* who eliminated the use of cost data in their calculations for time management indicators. Since the ES method originated from the traditional cost-driven EVM metrics, they still heavily relied on the initial cost estimates to calculate time performance metrics. Therefore, these authors argued that the use of these cost numbers does not always lead to reliable results, and therefore, introduced a new approach, known as the Earned Duration *(ED)* method by eliminating the use of cost data in the schedule context. Further academic research on this ED method is currently restricted to a paper by Batselier and Vanhoucke *(2015)*, but it is expected that new research results are on their way or are maybe already under revision. Keep an eye on upcoming publications in flagship academic journals and the software vendors implementing these good ideas in excellent new systems!

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