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Integration of Uncertainty in EDM Methodology

Acebes F[121], Pajares J, Villafáñez F, López-Paredes A

Abstract Since the Earned Duration Management (EDM) methodology was introduced as an alternative tool for project monitoring and control, several research projects have arisen to take advantage of the results offered by this methodology. The objective of this paper is twofold, on the one hand, to incorporate uncertainty into the project activities and to use EDM methodology together with statistical techniques to control and estimate the final project duration. On the other hand, it is intended to compare deterministic techniques of project time estimation based on Earned Value (EVM) methodology with respect to stochastic techniques based on artificial intelligence.

Keywords: Earned Duration Management; Earned Value; Project Control; Duration Forecasting; Statistical Learning

1 Introduction

Monitoring and control activities are a crucial aspect of project management throughout the whole life cycle of the Project. Earned Value Management (EVM) is probably the most widely used tool for project control. This methodology is also used to control the project schedule, after was introduced the concept Earned Schedule (ES).

Since then, there have been a large number of studies related to the improvement of this tool, which allow the monitoring and control tasks of the project to be carried out with greater precision. Khamooshi & Golafshani (2014) try to improve the EVM methodology by introducing the EDM (Earned Duration Management) methodology for monitoring and controlling the project schedule. The authors propose indicators in which the parameters relating to the project

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duration are decoupled from cost measures. After the introduction of this methodology, studies have been published comparing the results obtained for the same project using EVM versus EDM methodology.

2 Objectives

In this paper, we want to incorporate uncertainty in the definition of the project activities duration. Once this uncertainty has been programmed for each activity, we want to know if it is possible to use tools that allow us to control the project (Acebes et al., 2015), using the EDM methodology as a basis. At the same time, and maintaining the uncertainty of the activities, we want to know if it is possible to estimate the final project duration using the indicators proposed by Khamooshi and Golafshani (2014). Will be to carry out a comparative study between EVM and EDM methodologies. This comparative study will allow us to know the effectiveness of this methodology (EDM) in environments with uncertainty. To do this, we calculate the error that takes place in each control instant between the estimated value and the real future value.

3 Conclusion

In this article we have demonstrated the possibility of incorporating uncertainty into project activities and, with it, we have been able to use the EDM methodology to control the project, and also to estimate the final duration of the project, considering environments with uncertainty. We have used a real project to test the possibility of using this methodology as a control tool. But also, by comparing the results obtained with other methodologies, we have shown that the results are accurate. Finally, we understand that the use of stochastic methodologies will provide more accurate control and forecasting data than deterministic methodologies.

4 References

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