

The Economic Impact of Software Process Variations^{*}

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Abstract. The economic benefit of a certain development process or particular activity is usually unknown and indeed hard to predict. However, the cost-effectiveness of process improvements is of paramount importance and the question how profitable certain activities are needs to be answered. Within a large-scale commercial organization, we were challenged with the task to quantify the *economic* benefit of isolated test and development environments. To answer this question we defined a generic process model based on absorbing Markov chains that allows to analyze the economic benefit of software process variations. This model exposes conflicts between process steps and reiterations of development activities and thereby provides a highly flexible tool for the investigation of the effects of changes to a development process on its overall performance. This model was used to predict the impact of isolated testing on the overall effort and duration of projects at BMW. The results obtained correspond well with the perception of experienced developers and gives a detailed explanation for the effects. Besides this, it can be used to analyze various other economic aspects of software development processes and yields an interesting alternative for cost estimation.