

Sequence Effects in Judgment-based Software Development Work-Effort Forecasting

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Abstract

Accurate forecasts of work-effort are essential to enable successful software development projects. Such forecasts are typically judgment-based and inaccurate. One important reason for the inaccuracy may be due to the “sequence effect”, i.e., that initial software development work-effort forecasts may affect subsequent, even unrelated, judgment-based forecasting work. If, for example, the previously forecasted development task was small, there seems to be a tendency to under-estimate the work-effort of the following task.

We report sequence effects found in the laboratory and in the field. In a laboratory-based experiment, we randomly divided 56 software professionals into two groups. One group started with work-effort forecasts of a small and the other of a larger software development task. Subsequently, all the software professionals were asked to forecast the work-effort of the same medium-sized task. We found that the forecasts of the medium-sized tasks were assimilated towards the initial forecasts, i.e., the group that initially forecasted a small task submitted, on average, lower forecasts of the medium-sized task than the group that initially forecasted a larger task. We found similar results in a field experiment. Forty software companies from Asia and Eastern Europe were hired to forecast the work-effort of the same five software development projects. The companies that started with forecasts of the largest projects submitted, on average, the highest forecasts of the other projects.

The typical approach for software development work-effort forecasting is based on a decomposition of projects into sub-tasks. A possible consequence of our results is that software professionals should start with forecasts of medium complex, medium sized sub-tasks of the project, or, with large and complex task if there is a strong tendency towards over-optimistic forecasts.