An Empirical Validation of Object-Oriented Metrics in Two Different Iterative Software Processes

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Abstract

Object-oriented (OO) metrics are used mainly to predict software engineering activities/efforts such as maintenance effort, error proneness, and error rate. There have been discussions about the effectiveness of metrics in different contexts. In this paper, we present an empirical study of OO metrics in two iterative processes: the short-cycled agile process and the long-cycled framework evolution process. We find that OO metrics are effective in predicting design efforts and source lines of code added, changed, and deleted in the short-cycled agile process and ineffective in predicting the same aspects in the long-cycled framework process. This leads us to believe that OO metrics' predictive capability is limited to the design and implementation changes during the development iterations, not the long-term evolution of an established system in different releases.

Index Terms—Software metrics, agile process, empirical validation, framework evolution