

Empirical Exploration of Correlations between Software Design Measures: A Replication Study

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Abstract : Software engineers apply different measures to quantify the quality of software design. These measures consider artifacts developed at low or high level software design phases. The results are used to point to design weaknesses and to indicate design points that have to be restructured. Understanding the relationship among the quality measures and among the design quality aspects considered by these measures is important to interpreting the impact of a measure for a quality aspect on other potentially related aspects. In addition, exploring the relationship between quality measures helps to explain the impact of different quality measures on external quality aspects, such as reliability and maintainability. In this paper, we report a replication study that empirically explores the correlation between six well known and commonly applied design quality measures. These measures consider several quality aspects, including complexity, cohesion, coupling, and inheritance. The results indicate that inheritance measures are weakly correlated to other measures, whereas complexity, coupling, and cohesion measures are mostly strongly correlated.

Keywords : quality attribute, quality measure, software design quality, Spearman correlation

Conference Title : ICCSIT 2018 : International Conference on Computer Science and Information Technology

Conference Location : Rome, Italy

Conference Dates : March 05-06, 2018