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On the relationship of class stability and maintainability

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Abstract: Maintainability is an essential software quality attribute as software maintenance is a costly process. ISO 9126 characterised maintainability with five sub-characteristics, one of which is stability. Unstable software may lead to high maintenance cost and effort. Classes in object-oriented systems form the basic elements of the software architecture; hence, stable classes may contribute to reducing the software maintenance cost and effort. In this study, the author conducts an empirical study to evaluate the relationship between class stability and maintainability. The author correlates class stability with maintainability effort measured by the number of hours spent on maintenance activities and by the line of code changes. Results show that classes with higher values of stability measured by the class stability metric (CSM) are associated with a lower value of perfective maintenance effort measured by hours. CSM also correlated with all types of maintenance (corrective, adaptive and perfective) if measured for the cumulatively combined system classes in all iterations rather than per iteration. The author also found that none of the stability metrics show a relationship with maintainability when measured by number of line of code changes.

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