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Quality Impact of Configuration and Customisation on Configurable Software

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Abstract

A case study is performed on a weighbridge application which allows for configurations and customer-specific modifications. A literature review includes topics of software quality, software customisation, and ontology. The effects of the customisations and modifications are evaluated for the structural and functional quality of the system, and the configuration architecture assessed for its success in accommodating configuration and customisation from a quality perspective. A statistical model is defined to estimate how the number of defects may change with modifications to a system. The structural quality is measured using the Maintainability Index and Overview Pyramids. The functional quality is assessed using defect data recorded in the task tracking software Jira and the revision history stored using the version control software Git. The amount of modification is measured using the number of rules defined per customer. The results indicate that structural quality is unaffected by the modifications, and that the functional quality is reduced as more customisation rules are defined indicating a partial success of the architecture.