Errors Made During Manual Test Case Derivation from UML Activity Diagrams and State Machines: Results of a Controlled Experiment

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1 Overview

This talk presents our recent Information and Software Technology journal article [FH15] on a controlled experiment on manual test case derivation from UML activity diagrams and state machines. Manual test case derivation from behavioral models like UML activity diagrams or state machines is frequently applied in practice. But this kind of manual test case derivation is error-prone and knowing these errors makes it possible to provide guidelines to reduce them. The objective of the study presented in this talk therefore is to examine which errors are possible and actually made when manually deriving test cases from UML activity diagrams or state machines and whether there are differences between these diagram types. We investigate the errors made when deriving test cases manually in a controlled student experiment. The experiment was performed and internally replicated with overall 84 participants divided into three groups at two institutions. As a result of our experiment, we provide a taxonomy of errors made and their frequencies. In addition, our experiment provides evidence that activity diagrams have a higher perceived comprehensibility but also a higher error-proneness than state machines with regard to manual test case derivation. This information enables the development of guidelines for manual test case derivation from UML activity diagrams and state machines which help to make manual test case derivation less error-prone and are also discussed in this talk.

2 References


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