

Summary Document of

Model-Based Exploratory Testing: A Controlled Experiment

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by Groza Vlad, Guia Alex, Hideg Paul

The goal of the study is to improve the efficiency of software testing through the integration of Model-Based Testing (MBT) and exploratory testing into a single approach called Model-Based Exploratory Testing (MBET). To assess this approach, in the paper, an experiment is conducted using an educational game application with multiple versions and the number and type of defects detected with the MBET and MBT approaches are collected. The educational game used was developed by WoWiWe Instruction Co, whereas the the MBET framework was implemented using the Crushinator, which is an automated testing tool that provides a framework for MBT and exploratory testing.

To determine the effectiveness of MBET, several key research questions can be formulated along with specific metrics for evaluation. First, the study seeks to determine if MBET can detect more defects compared to traditional MBT. This is measured by comparing the total number of defects identified by each method when applied to the educational game application. Additionally, the study explores whether MBET enhances the detection of different types of defects more effectively than MBT. This is analyzed by classifying and counting the types of defects (e.g., functional, UI, connectivity) uncovered by each testing approach. Another crucial aspect of this research is to evaluate the impact of MBET on the time resources required for exploratory testing processes, specifically focusing on the time spent on test case generation and execution. For that, the average and total time taken for test case generation and execution in both methods are calculated.

Methodologically, the study utilizes the Crushinator. Test cases are generated and executed based on a UML model of the software under test (SUT), and data are collected from the Crushinator's logs. This includes categorization of defects by type and documentation of the duration of testing activities. The results are expected to provide insightful comparisons between MBET and MBT, highlighting the potential benefits of the integrated approach in achieving more comprehensive test coverage and efficiency in defect detection.

Therefore, the study enlists detailed objectives including the goal of enhancing the use of exploratory testing together with model-based testing. Thus, the findings are anticipated to highlight the advantages of combining automated and exploratory testing techniques.