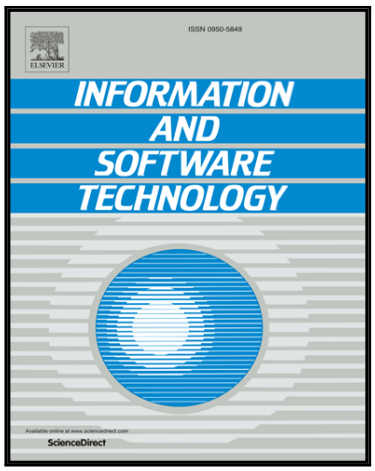

Model-Driven Architecture Based Testing: A Systematic Literature Review

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Model-Driven Architecture Based Testing: A Systematic Literature Review

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Context: Model-driven architecture based testing (MDABT) adopts architectural models of a system under test and/or its environment to derive test artifacts. In the literature, different MDABT approaches have been provided together with the corresponding lessons results and lessons learned.

Objective: The overall objective of this paper is to identify the published concerns for applying MDABT, identify the proposed solutions, and describe the current research directions for MDABT.

Method: To this end we have provided a systematic literature review (SLR) that is conducted by a multi-phase study selection process using the published literature in major software engineering journals and conference proceedings.

Results: We reviewed 739 papers that are discovered using a well-planned review protocol, and 31 of them were assessed as primary studies related to our research questions. Based on the analysis of the data extraction process, we discuss the primary trends and approaches and present the identified obstacles.

Conclusion: This study shows that although a generic process the approaches different in various ways with different goals, modelling abstractions and results. Further, based on the synthesis process in the SLR we can state that the potential of MDABT has not been fully exploited yet.

Keywords: model-based testing, software architecture, systematic review

1. Introduction

Software testing is a process of investigating a software product to identify possible mismatches between expected and present requirements of the system [1][15]. One of the main motivations of software testing is to ensure the correctness of a software system. Software is correct if and only if each valid input to the system produces an output according to system specifications. Therefore, software must be verified and validated according to the provided specifications. Moreover, software testing requires executions of test cases which can detect possible bugs, errors and defects.