

Models and Testing – A Recipe for Improved Effectiveness?

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Abstract. In an ongoing effort to reduce development costs in spite of increasing system complexity, Motorola has been a long-time adopter of Model-Driven Engineering practices. The foundation of this approach is the creation of rigorous models throughout the development process, thereby, enabling the introduction of automation into the development life cycle and supporting frameworks.

1 Introduction

In this talk we present Motorola's experiences over the past 15 years in using models [1][2] to improve testing effectiveness from defect prevention through to test configuration. We present the motivation(s) for using models and in particular their impact on product testing and quality. Specifically, we present and discuss cases and metrics where models have been used for:

- *Defect Prevention.* We present the approaches that have been employed for the early discovery of defects through the application of requirements verification techniques and the lessons learnt from doing so. In addition, we introduce recent work on trying to fix identified defects automatically through the application of inference [3][4][5];
- *Early testing of designs* through the use of co-simulation, as well as, experiences from previous usage of formal verification techniques[6];
- *Aiding test development and reuse.* In this case we discuss some of the issues encountered during general test development and elaborate why modeling concepts are useful in overcoming some of these obstacles [7];
- *Enabling test generation and automation.* It is well understood that models can lend themselves to test generation. We present some of the issues learnt and also their application within the context of existing modeling and test standards, such as UML, TTCN-3, MSC etc.;
- *Model-driven testability.* Here we introduce recent work on using models for the systematic understanding of testability concerns [8], which are crucial for cost effective test automation.

We also present lessons learnt from deploying model-related technologies and the different business strategies that have been used to effect their deployment, e.g. maturity

models, aspects, and services. In doing so, we discuss the lessons learnt and directions/challenges moving forward with the perspective of a large testing technology portfolio.

References

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