TESTING-BASED CONCEPTUAL SCHEMA VALIDATION IN A MODEL-DRIVEN ENVIRONMENT

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MODEL DRIVEN DEVELOPMENT (MDD)

MDD is being used in a wide range of systems (e.g. telecommunications, business, defense/aerodynamics/avionic, web) (Mohagheghi and Dehlen, 2008).

- Improve communication between stakeholders.
- Portability of solutions and traceability.
- Increase productivity and shortening development time.
- Reduce labour-intensive tasks.
- Manage requirements volatility.

MAIN MOTIVATIONS

WHAT IS THE PROBLEM?

Software life-cycle

<table>
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<tr>
<th>Requirements</th>
<th>Analysis</th>
<th>Design</th>
<th>Implementation</th>
<th>Testing</th>
<th>Release</th>
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<tbody>
<tr>
<td><strong>Conceptual Schema</strong></td>
<td>Model</td>
<td>Code</td>
<td>Testing</td>
<td>Defects</td>
<td>Early testing-based validation</td>
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<td><strong>To detect Defects</strong></td>
<td>Problems</td>
<td>Early testing-based validation</td>
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<td>Requirements errors are the most common</td>
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<td>Defects propagation</td>
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<td>Lack validation tools integrated to MDD environment</td>
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<td>Lack feedback for supporting decisions</td>
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What is our Proposed Approach?

TESTING-BASED VALIDATION OF THE CONCEPTUAL SCHEMAS

General

Design a testing-based validation approach to improve the quality of conceptual schemas built in an MDD environment.

Specifics

- O1: Define derivation rules which can produce the test model from a requirements model.
- O2: Concretize abstract test cases obtained from the model.
- O3: Define a process to derive a conceptual schema under test considering a MDD environment.
- O4: Select quality properties and defect types to be covered with the proposed solution.
- O5: Derivate the feedback and the defect report.

Goals and Contributions

OBJECTIVES

- Decrease development costs
- Improve the quality of software
- Improve support for decision-making
- Improve the quality of conceptual schemas built in an MDD environment.
- Reduce defect input to MDD environment.

An Example: Online Conference Review System

PHASE 1: Derive the Test Model

PHASE 3: Concrete Test Cases

PHASE 4: Test Cases

PHASE 5: Feedback

Benefits and Contributions

- Early testing-based validation
- Early to resolve
- Improve the quality of Software
- Decrease development costs
- Improves productivity

- Testing-based validation approach of conceptual schemas, by automatically generating test cases from requirements models (specifications).
- Integration of our approach to an existing quality assurance framework for MDD environments.
- Improve support for decision-making in the prioritising of repair of defects detected at the conceptual schema level.