

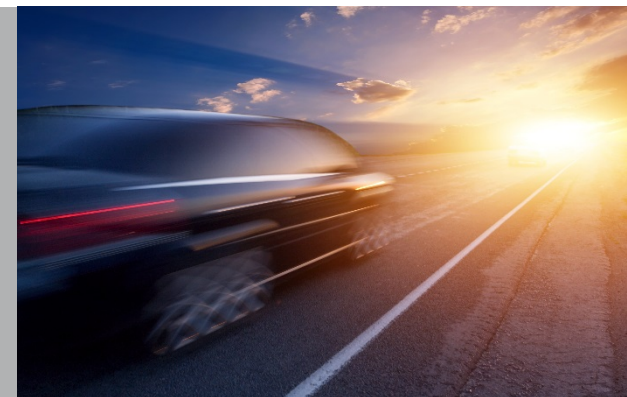
MODELING GUIDELINES FOR TESTABILITY

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MGI Group, May 29, 2018

SOFTWARE QUALITY.
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SOLUTIONS FOR INTEGRATED QUALITY ASSURANCE
OF EMBEDDED SOFTWARE

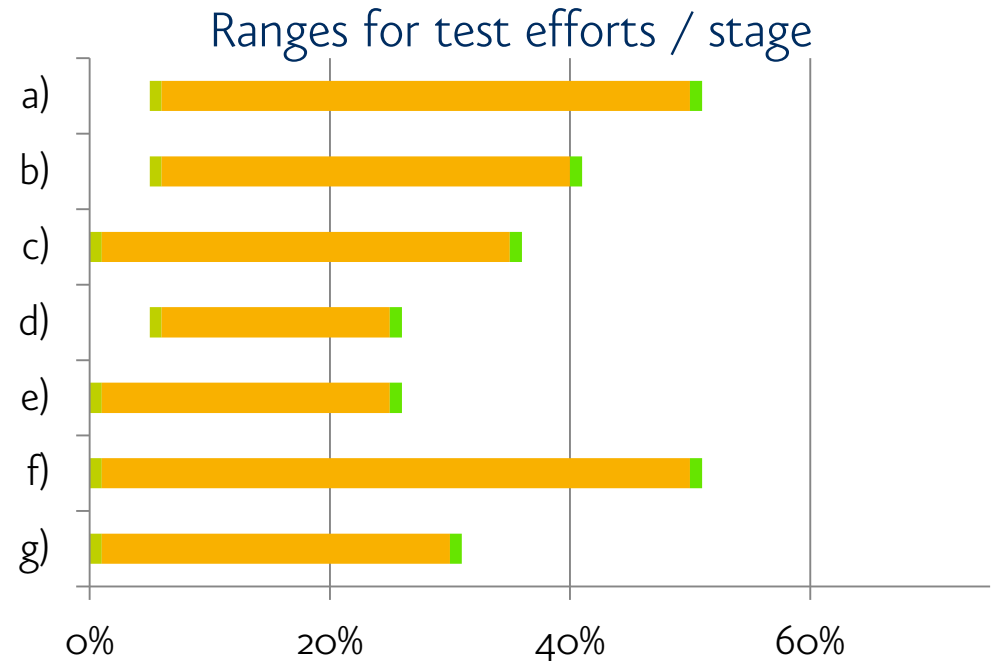


□ Testing requires large proportion of development effort

- Sources attribute 40% to 60% to total development cost

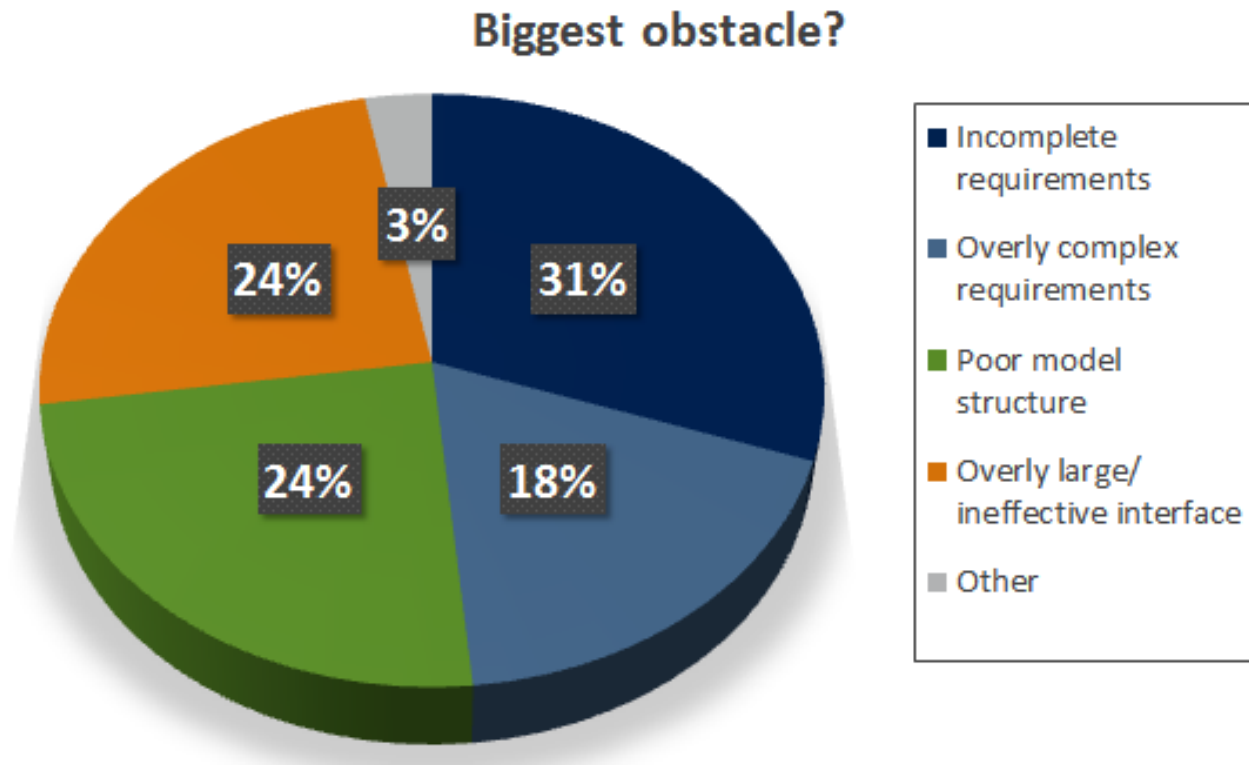
□ Stages of test process

- a) Requirements clarification
- b) Model preparation
- c) Test case specification
- d) Test case generation
- e) Test execution
- f) Test evaluation
- g) Coverage criteria assessment



What is your experience in the distribution of test efforts?

- Which area represents the biggest obstacle to testing models quickly and efficiently?



What is your experience?

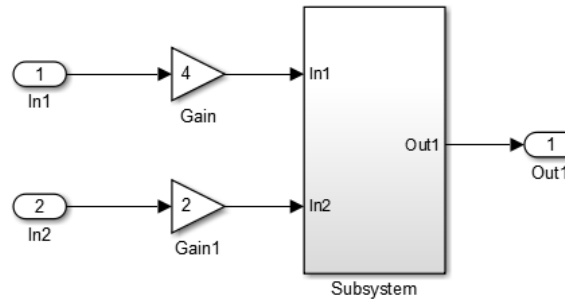
- Weak model structures will also affect test efforts
- Our findings:
 - Large interfaces
 - Too complex models

- But also:
 - Incomplete settings for SiL code generator configuration
 - Missing information on signal ranges for boundary value analysis
 - ...

- Hypothesis: Guidelines may help to prepare the model for testing
 - Existing but potentially also new guidelines

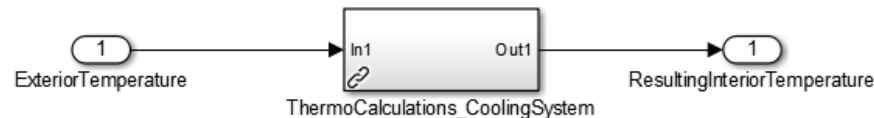
- ❑ “Avoid Blocks With Generic Name”: Blocks should not be named with the standard name from the block library.

- ❑ Counterexample:

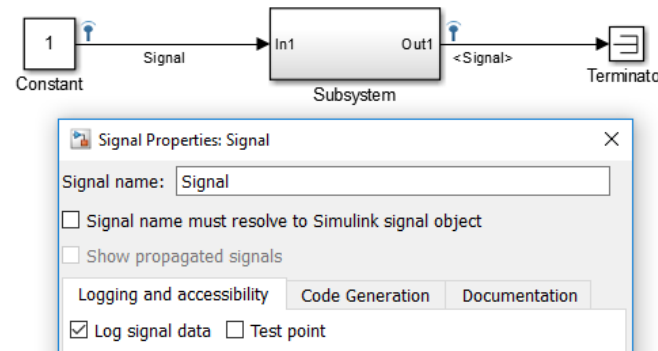


- ❑ Rationale:

- Block names should describe functionality, improving the readability
- Ensure traceability between variables generated in code and model
- Easy identification of logged data source



- “Naming of Logged Signals (Simulink/Embedded Coder)”:
Logged signals must be named or have a propagated name.
- Rationale:
 - In Simulink/Embedded Coder, a logged or tested signal is usually referred to by its (propagated) signal label; otherwise a generic name is used
 - In order to enable proper identification of logged signals in the model, logged signals shall have meaningful naming of logged signals



- ❑ Guideline Name:
- ❑ Guideline: “you should have a naming convention”
- ❑ Guideline: “prepare traceability from code / test results into model (as a source)”
- ❑ Guideline: “use only a single measuring point for a single signal” (no multiple measuring points per signal)
- ❑ Guideline: “limit number of characters of a signal name to prevent truncation of names by code generator”



Your proposals

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