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APPROACHES TO AUTOMATED TEST IMPLEMENTATION IN MODEL-DRIVEN TEST AUTOMATION ARCHITECTURES

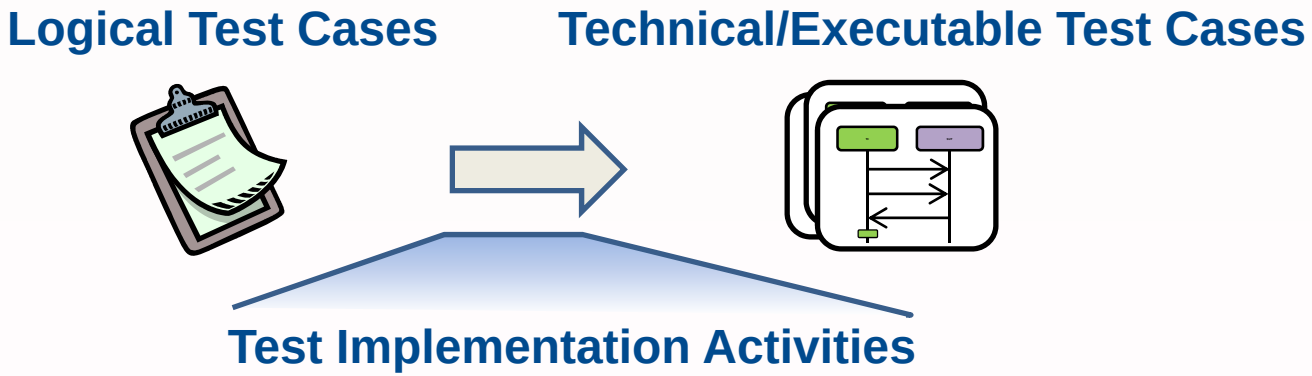
Presented by Marc-Florian Wendland

Fraunhofer FOKUS

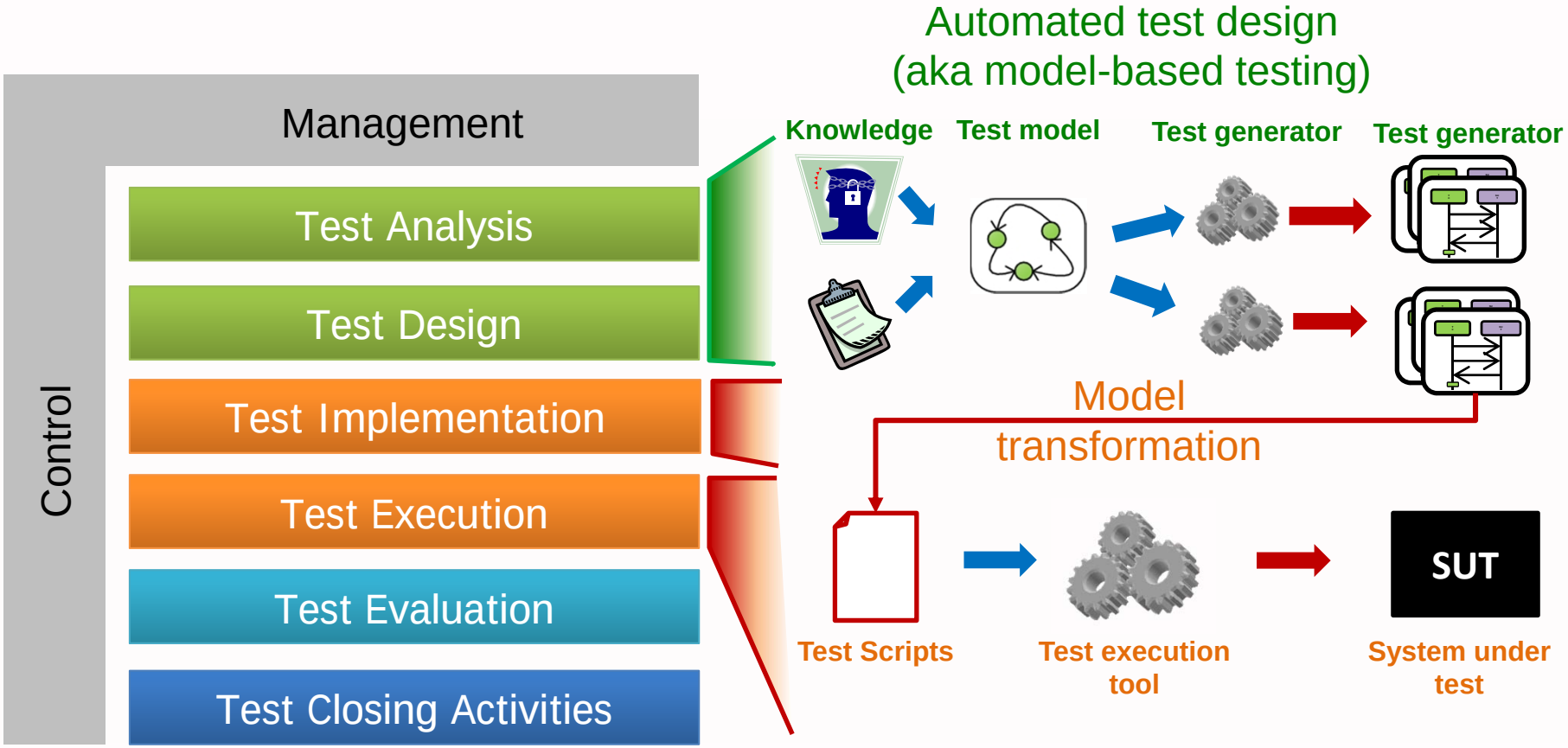
What is test implementation?

Definition ISTQB

"The process of developing and prioritizing test procedures, creating test data and, optionally, reparing test harnesses and writing automated test scripts."



The ISTQB fundemantal test process



Automated test execution is state of the practice (if ever) in industry

Using abtraction levels for automation

Question

How to increase the degree of automation from automated test execution to automated test design by remaining being immediately executable?

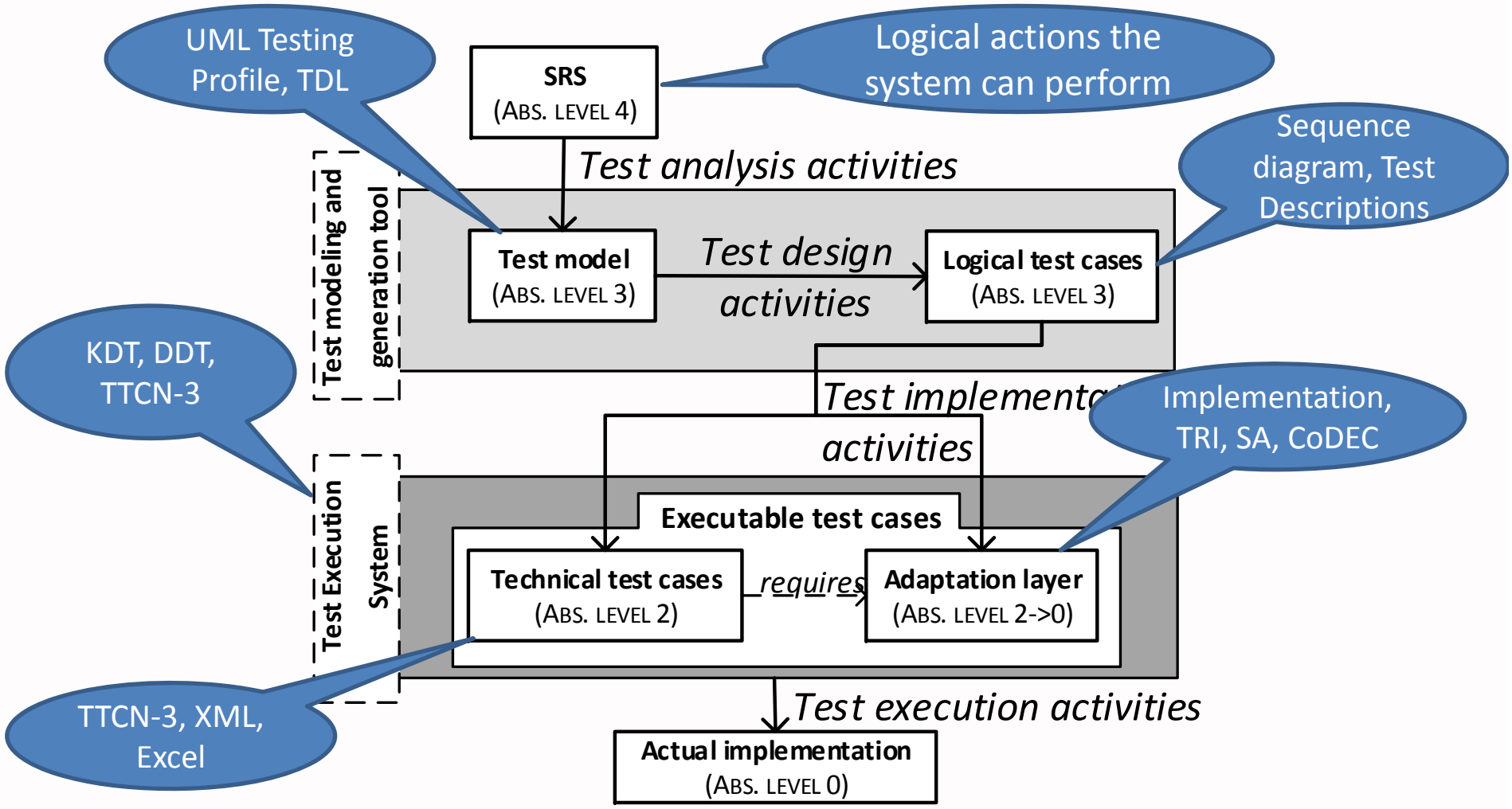
(Unsatisfying) Answer

Depends on the project circumstances

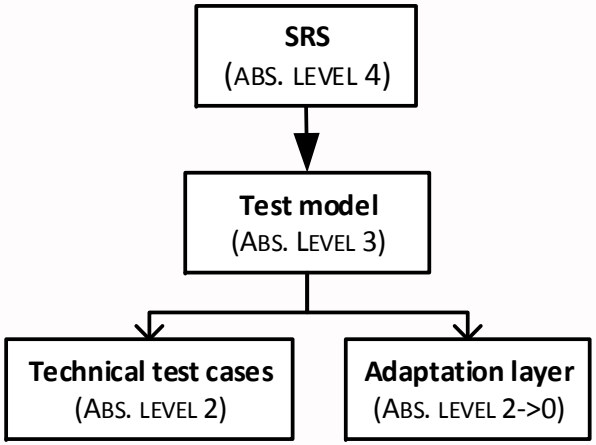
Idea

Leverage the notion of abstraction levels

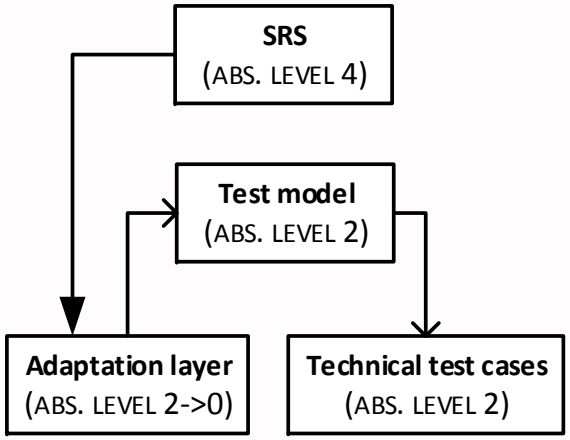
Optimal abstraction levels in test automation



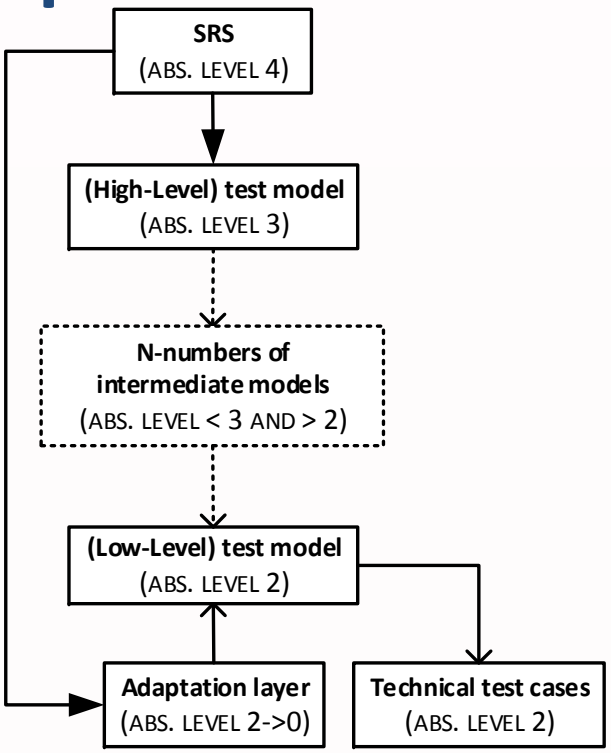
Approaches to automated test implementation



Top-down approach (i.e., model-is-master)



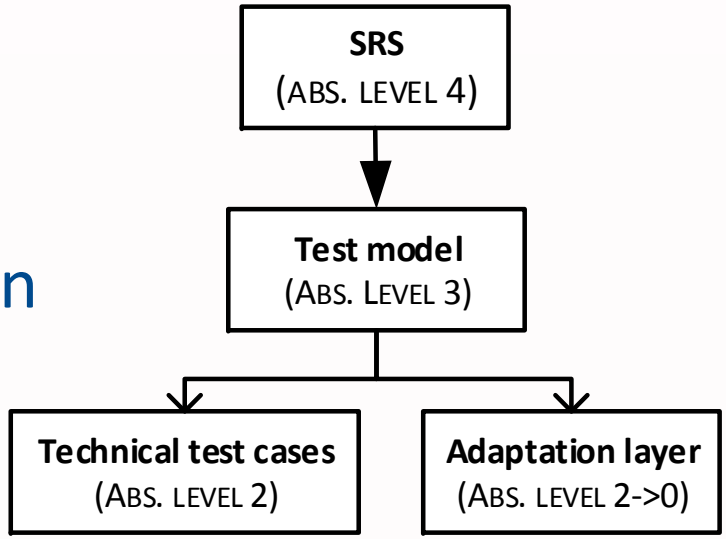
Bottom-up approach (i.e., Adaptation layer-is-master)



Meet-in-the-middle approach (i.e., Adaptation layer- and Model are equal)

Top-down approach

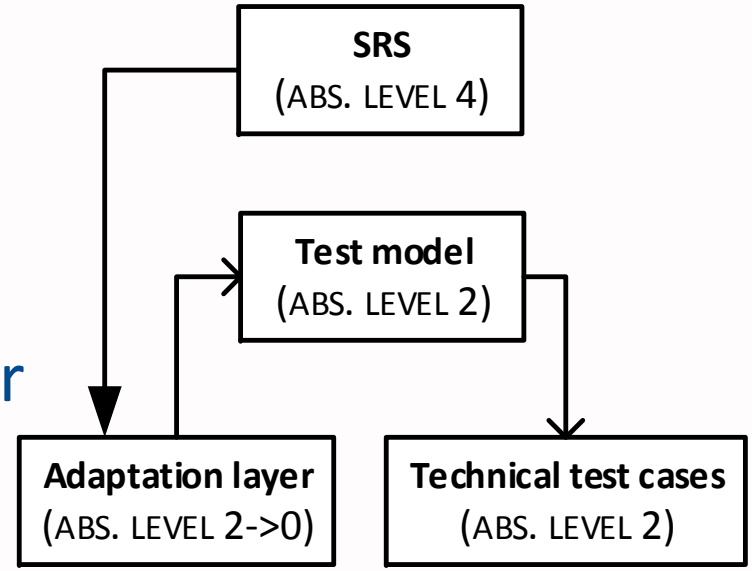
- Model is master
- Test design not imposed by adaptation layer or test execution system
- No constraint on the test execution system
- Early testing
- Often used in academic prototypes



Recommendation
Feasible for proof-of-concepts, limited use for industry projects

Bottom-up approach

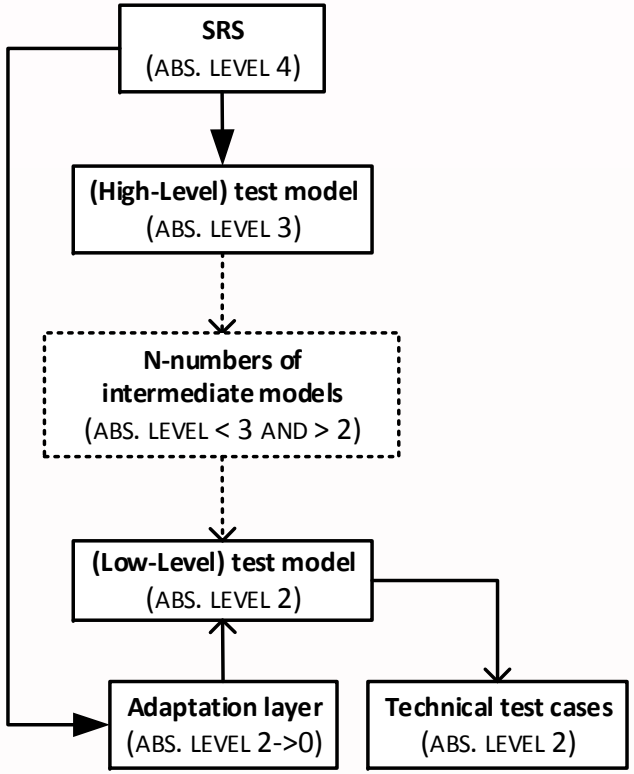
- Adaptation layer is master
- Ensures immediate automated test exection
- Requires available adaption layer
- Test model derived from the adaption layer
- Poorly abstracted adaptation layer propagtes ist poorness



Recommendation
Applicable if abstraction of adaptation layer is appropriate for domain experts

Meet-in-the-middle approach

- Combines advantages of top-down and bottom- approach
- Fosters early testing and ensures being immediately executable
- Any number of intermediate models possible
- Highest engineering complexity, but most flexible



Recommendation
For long running projects with frequently changing requirements

MIDAS Example: Bottom-up approach

Platform mapping (vertical)

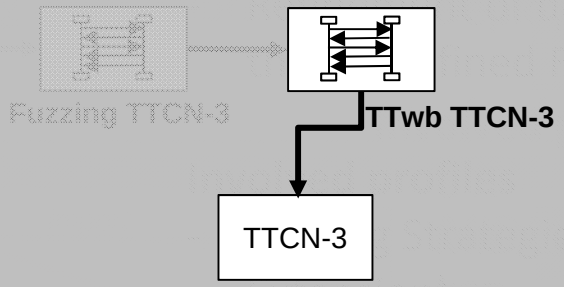
TTCN-3 code generation

Characteristics

- Generation of TTCN-3 modules according to deployment spec.
- Import of already deployed modules (built-in libs)

Involved profiles

- TTCN-3 PSM



SOA System

Imports | Transformation/ Generation | Trace Link | 3rd Party | xxx 3rd Party Component

Conclusion

- Three different approaches have been shown
- Based on an (informal) notion of abstraction levels
- Model transformations in between represent "the magical red button"
- (Initial) engineering effort can be quite high
- Bottom-up approach was realized in MIDAS
- Meet-in-the-middle approach reported by SIEMENS in the ICX project
- Future work will focus automated generation of test models from test suites

Contact

Fraunhofer FOKUS
Kaiserin-Augusta-Allee 31
10589 Berlin, Germany
www.fokus.fraunhofer.de

Marc-Florian Wendland
Senior Researcher, SQC
marc-florian.wendland@fokus.fraunhofer.de
Phone +49 (0)30 3463-7395