

Model-based Interoperability Testing

In Semiconductor Manufacturing using BPMN and Robot Framework

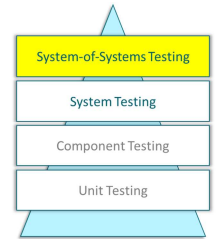
Authors: Konstantinos Traganos, Debjyoti Bera, Diego Damasceno, Raul Monti

Overview

Objective: Show that model-based testing (MBT) can improve the efficiency and effectiveness of testing system-of-systems (SoS) in industry.

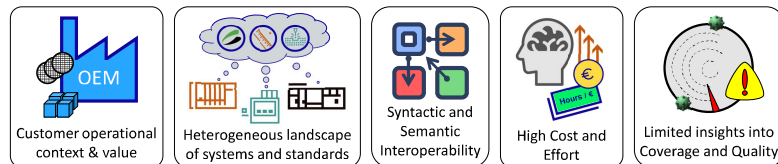
Motivation: Ensure that the constituent systems of a SoS are syntactically and semantically interoperable with each other and deliver on promised functionality in an operational context.

Method: Using the Business Process Model and Notation (BPMN) as our SoS specification language, we have developed a MBT methodology capable of generating interoperability and functionality test cases which can be executed using Robot framework. Using domain-specific languages under the hood, our MBT methodology is easily adaptable to rely on other industry standards such as SysML.



Challenges in Testing Systems-of-Systems

Ensuring Syntactic and Semantic Interoperability



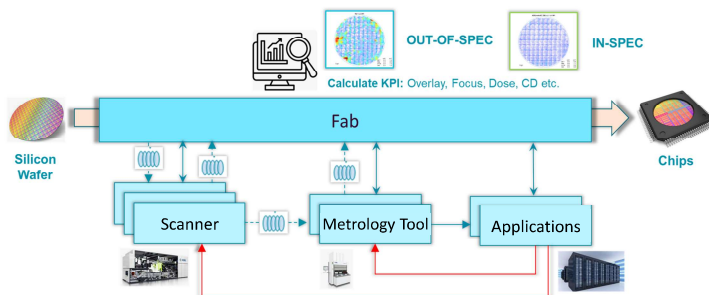
Problem Scope and Goals

Cover Variations in Control-flow, Data & Configuration



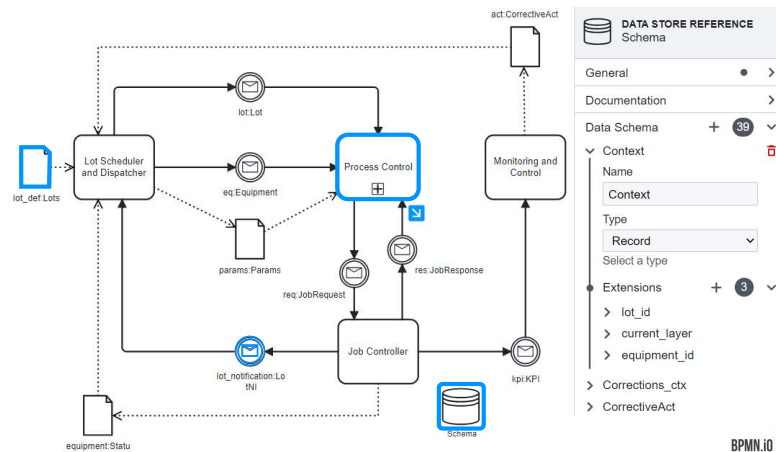
The 'Fab' in Semiconductor Manufacturing

How Modern Chips are Made



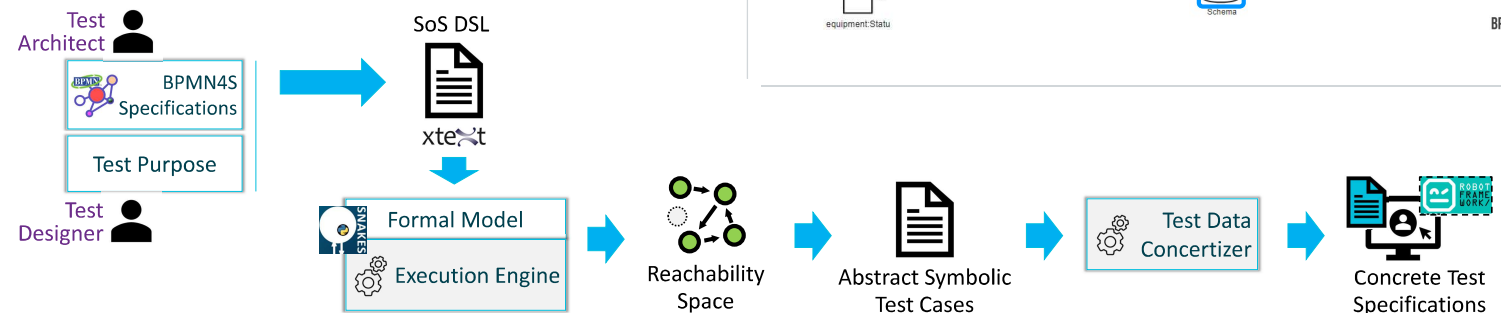
BPMN for System Modeling (BPMN4S)

Business Processes and Data Models



Model-Based Testing Methodology

Interoperability Test Case Generation for Product-Lines



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Contact:

debjyoti.bera@tno.nl
konstantinos.traganos@asml.com