

AMALTHEA4public 3th Advisory Board Meeting



AMALTHEA

Embedding APP4MC in a Systems Engineering development process

16 February 2017
Munich, Germany



Embedding APP4MC in a Systems Engineering development process

- Overall goal until end of the project: Provide an example on how APP4MC is embedded in an existing toolchain
 - Based on a fictional driver assistance system
 - Based on open source tools (easy replicability)

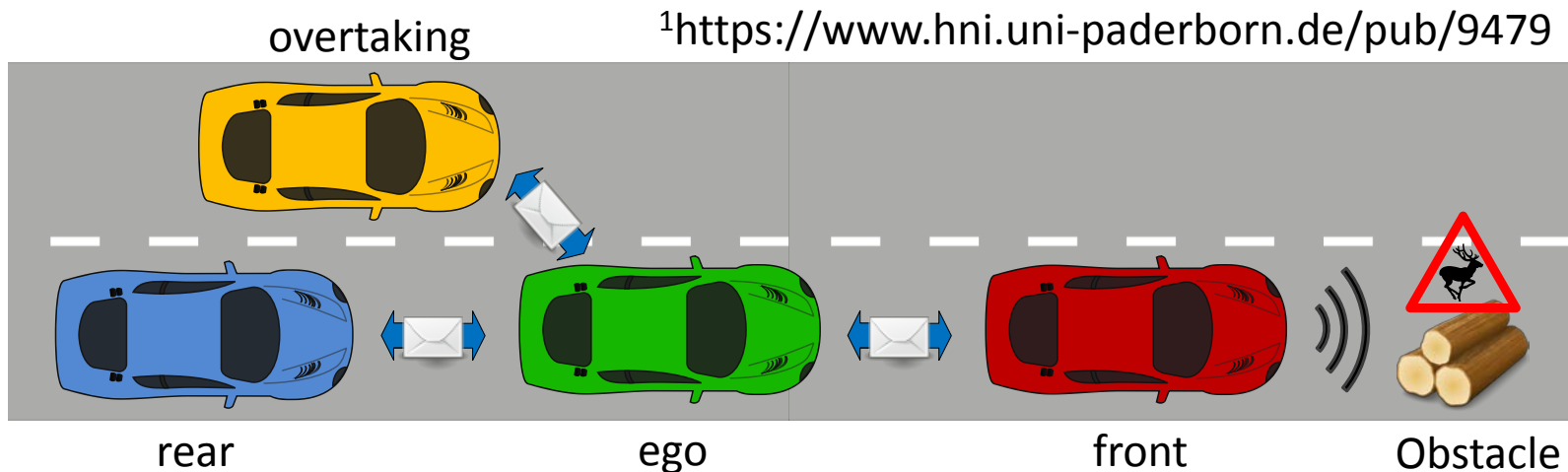
- Subgoals / what does embedding mean?:
 - Showcase trace link management with Capra
 - Showcase a model transformation from software design to APP4MC
 - Showcase how safety requirements can be handled

- Goals for today:
 - Showcase the current state of development
 - Discussion and feedback

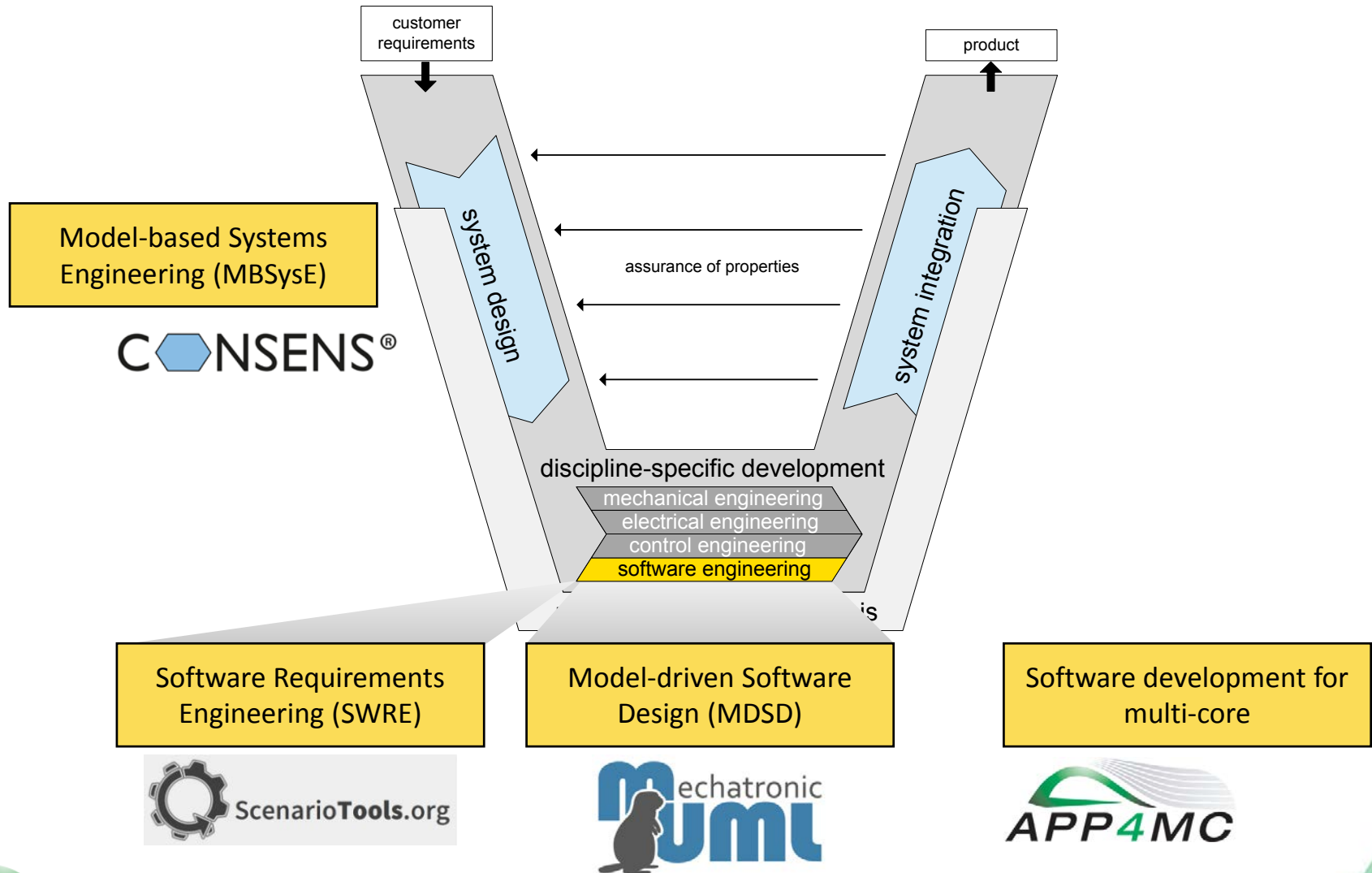
EBEAS¹ Overview

(Emergency Braking & Evasion Assistance System)

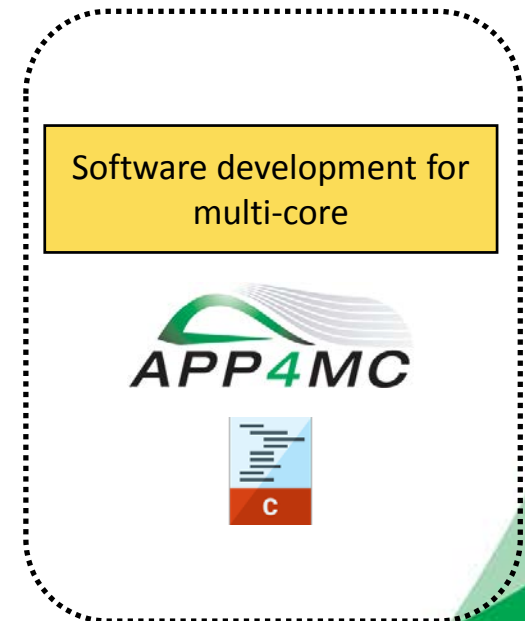
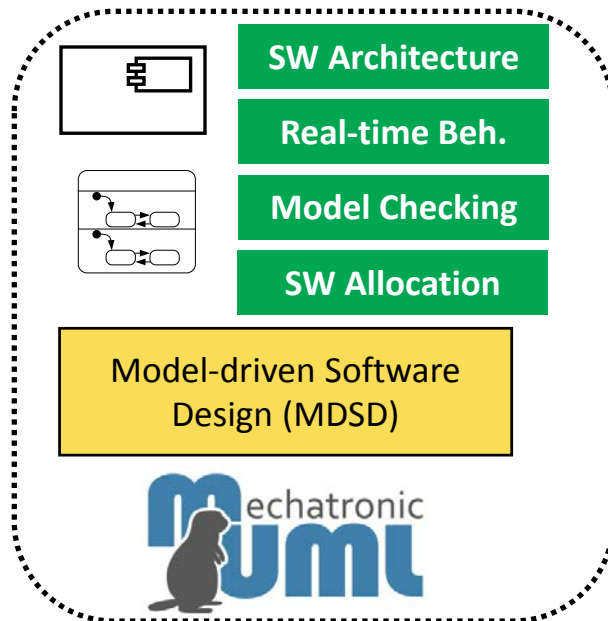
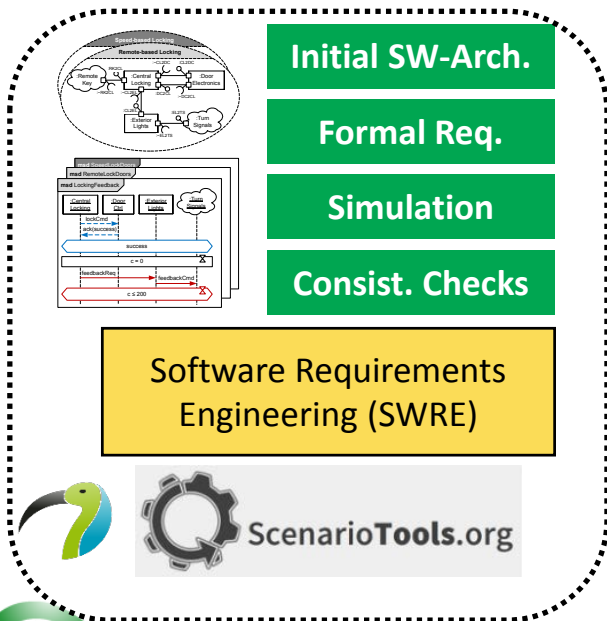
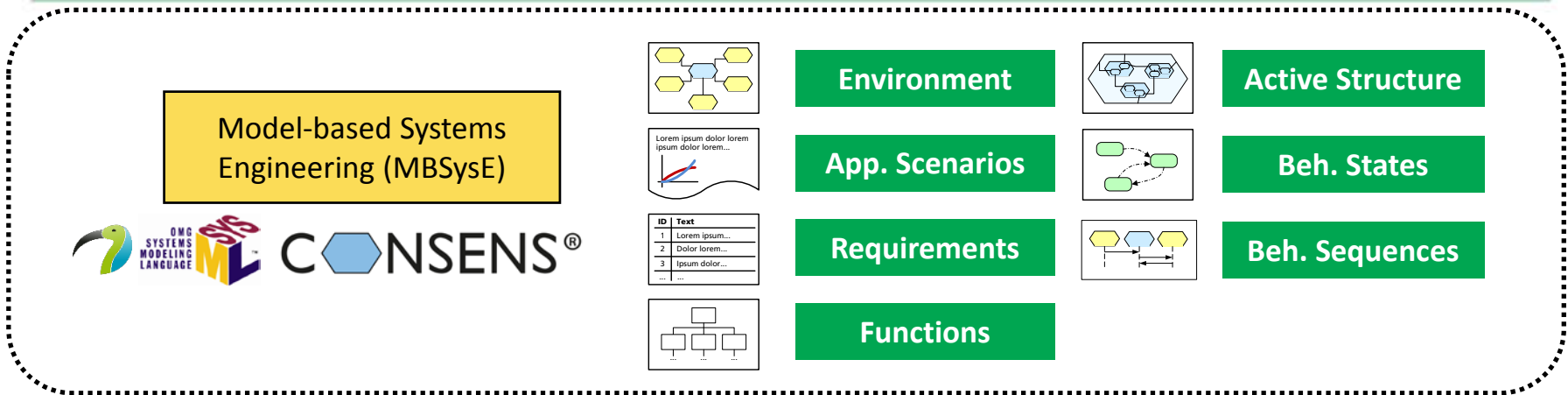
- Four autonomous, Car2Car-capable vehicles on a two-lane street
 - Front vehicle detects an obstacle and has to perform an emergency brake
 - Front vehicle notifies the following traffic which in turn has to handle the overall situation (depending on distances, available space, ...)
- Scope/SUD: ECU which realizes the intended functionality (i.e., Systems- & Software Engineering)



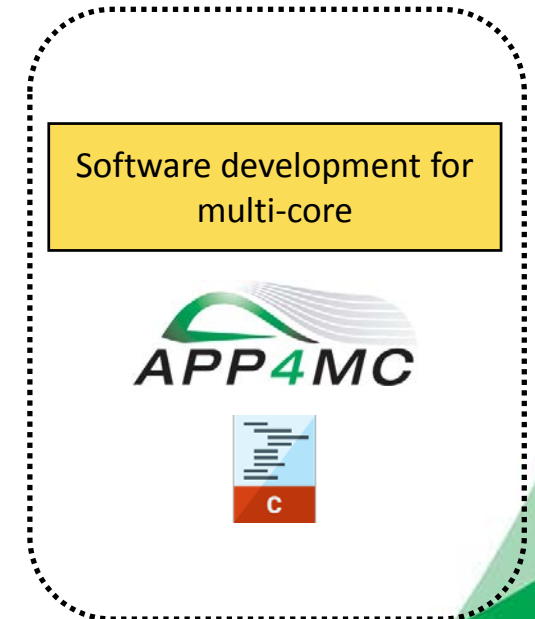
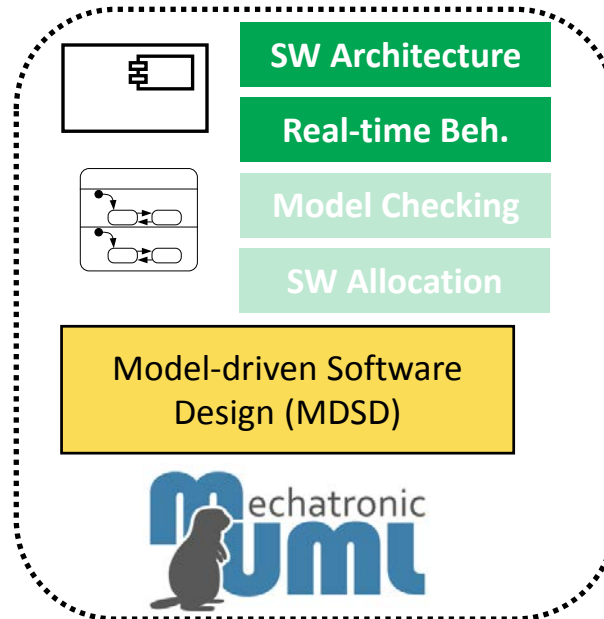
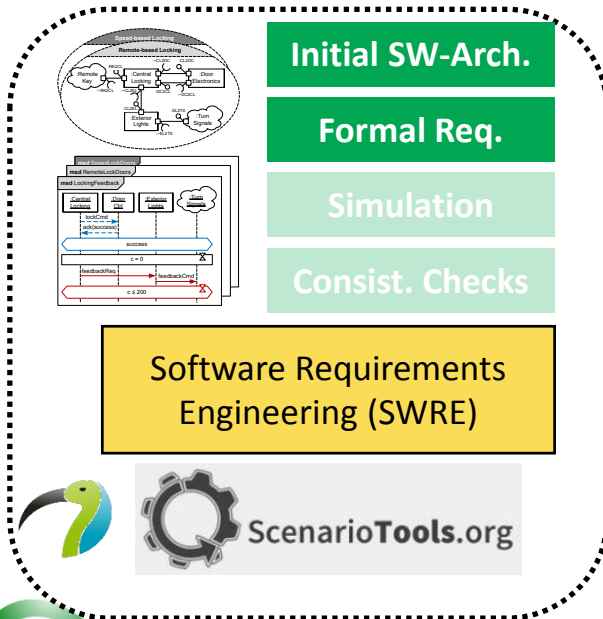
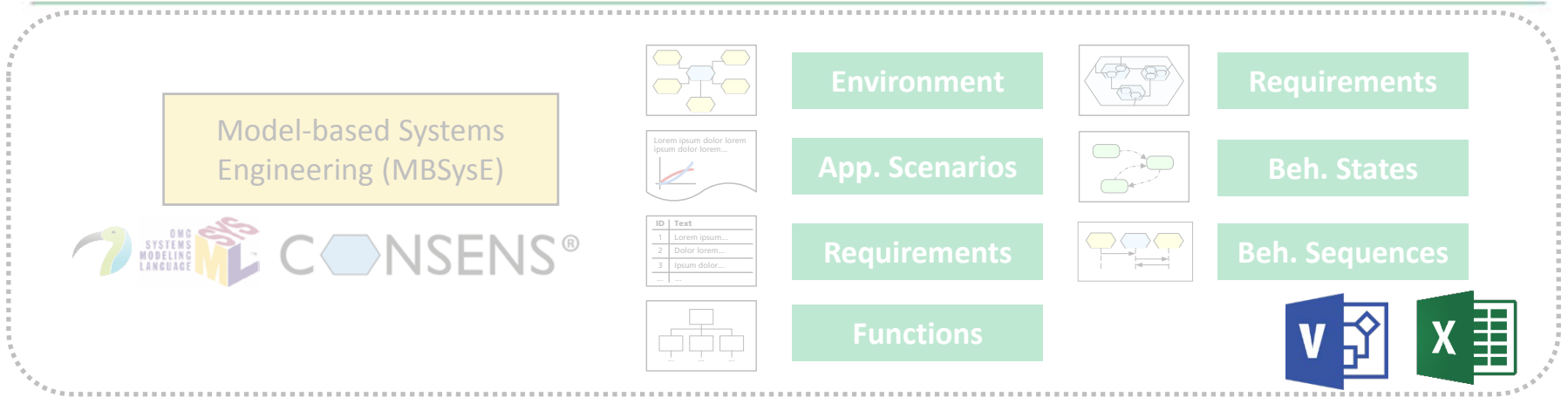
Development process overview



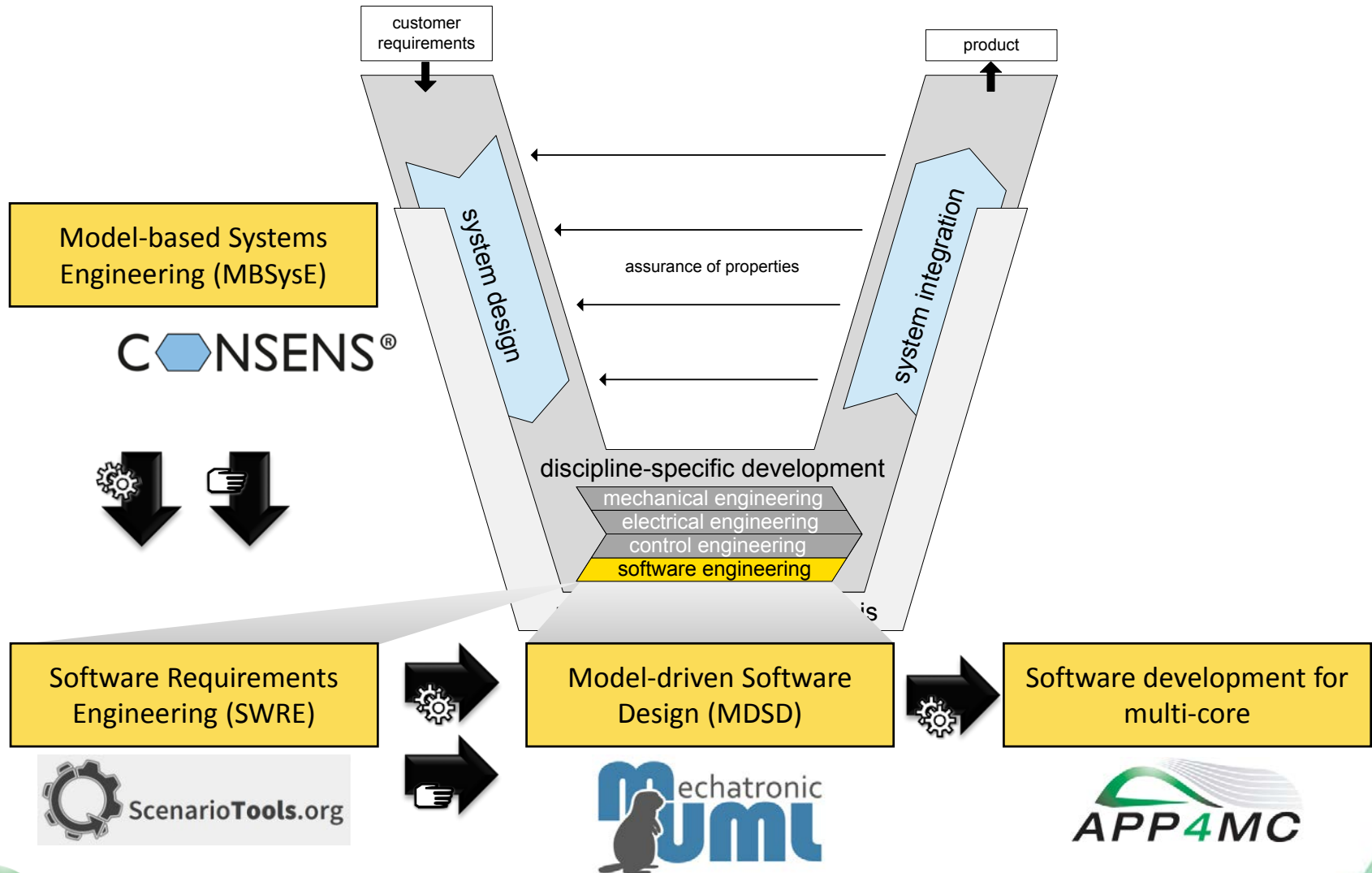
EBEAS Model Landscape

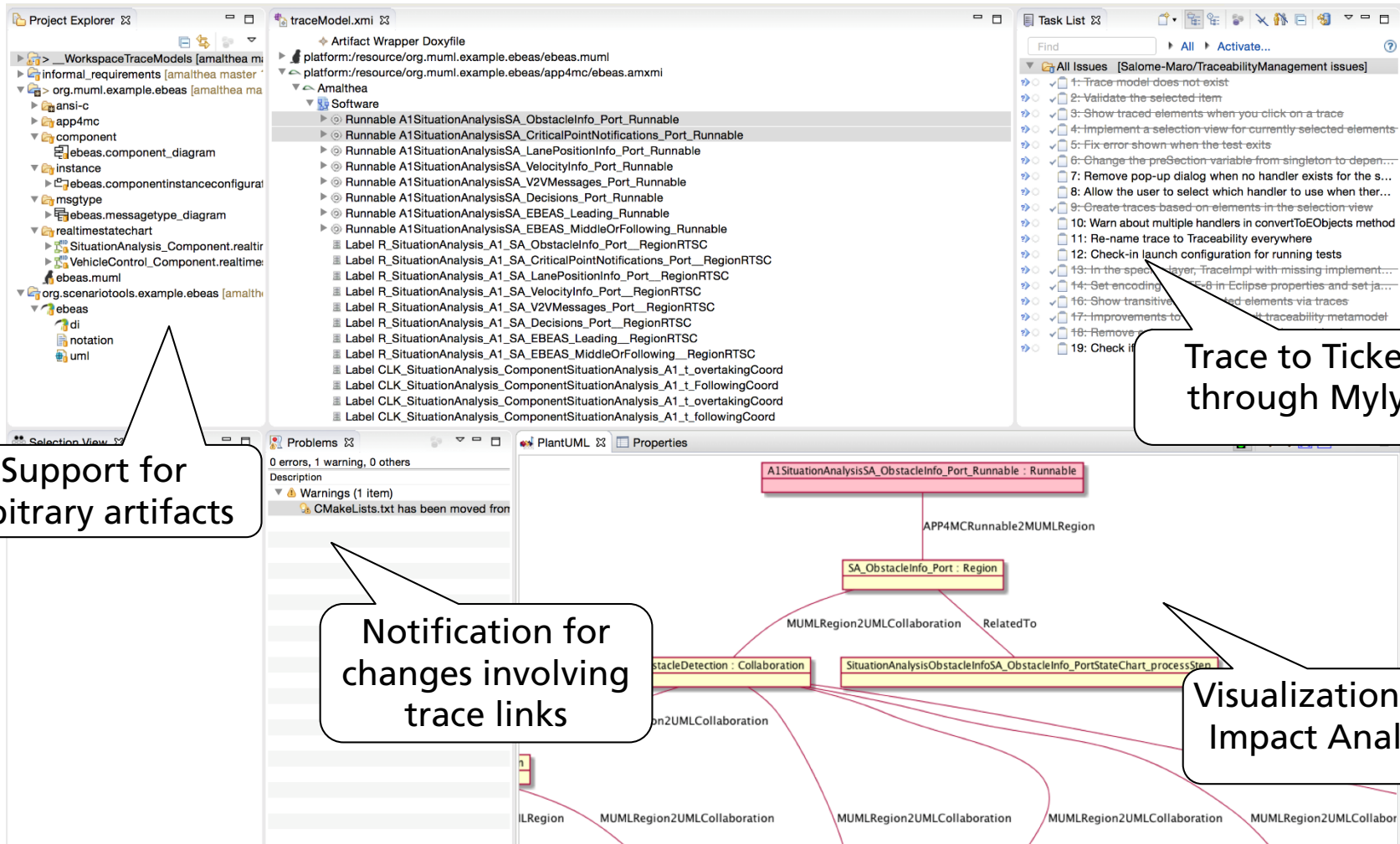


EBEAS Model Landscape (today)



Research at Fraunhofer IEM





The screenshot displays the Capra IDE interface with several key components:

- Project Explorer:** Shows a hierarchical view of the project structure, including folders like 'workspaceTraceModels', 'informal_requirements', and 'org.muml.example.ebeas'.
- traceModel.xml:** Displays the XML configuration for the trace model, listing various artifacts such as 'Runnable A1SituationAnalysisSA_...' and 'Label R_SituationAnalysis_...'.
- Task List:** Lists 19 issues related to 'Salome-Marco/TraceabilityManagement issues', including tasks like 'Trace-model does not exist', 'Validate the selected item', and 'Implement a selection view'.
- Problems:** Shows a warning: 'CMakeLists.txt has been moved from'.
- PlantUML:** Displays a UML diagram showing relationships between artifacts like 'A1SituationAnalysisSA_...', 'SA_...', and 'SituationAnalysisObstacleInfoSA_...'.

Support for arbitrary artifacts

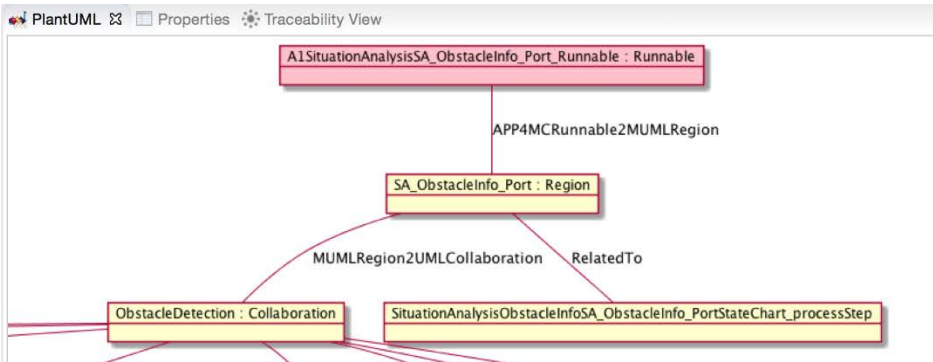
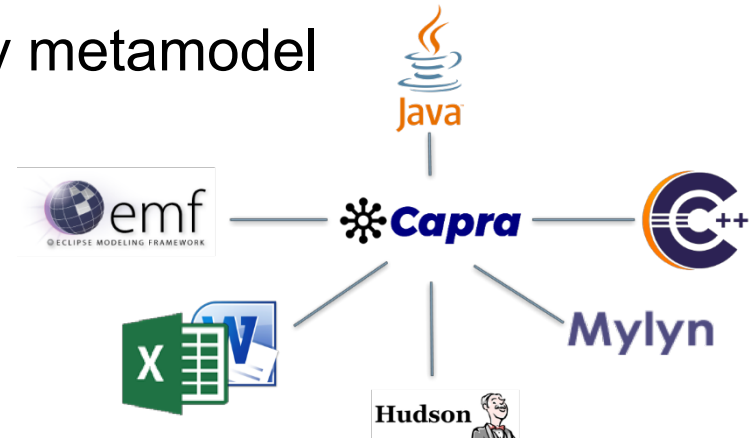
Notification for changes involving trace links

Trace to Tickets through Mylyn

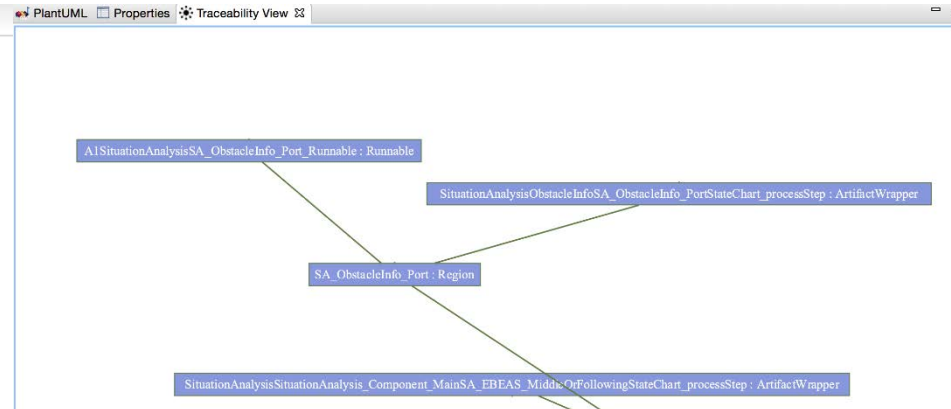
Visualizations for Impact Analysis

Capra - Flexibility and Extensibility

- Ability to define a custom traceability metamodel
- Ability to add more artifact handlers
- Ability to extend the Visualization



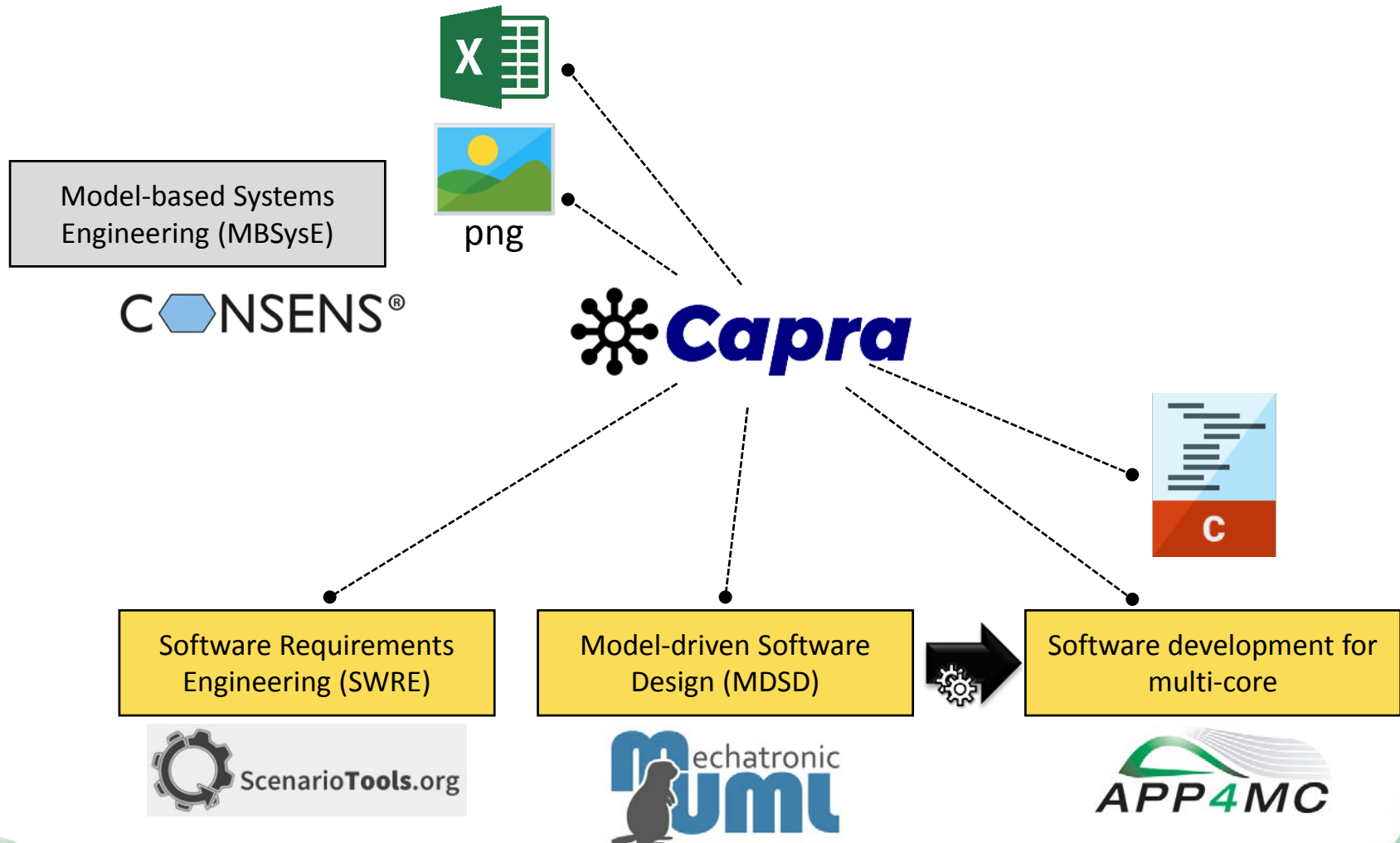
PlantUML



Zest

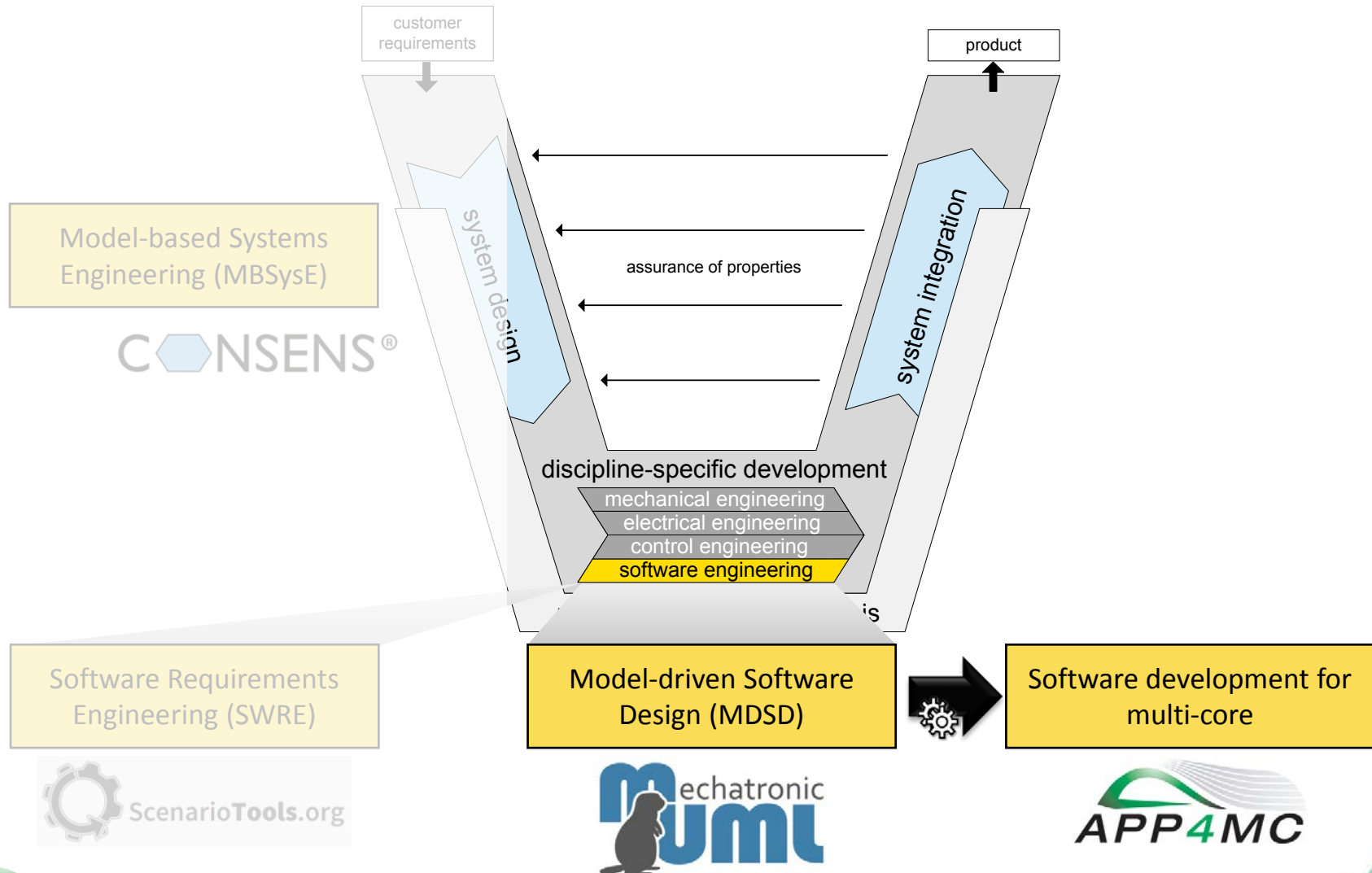
Scope of the demonstration

Tracelink management with Capra



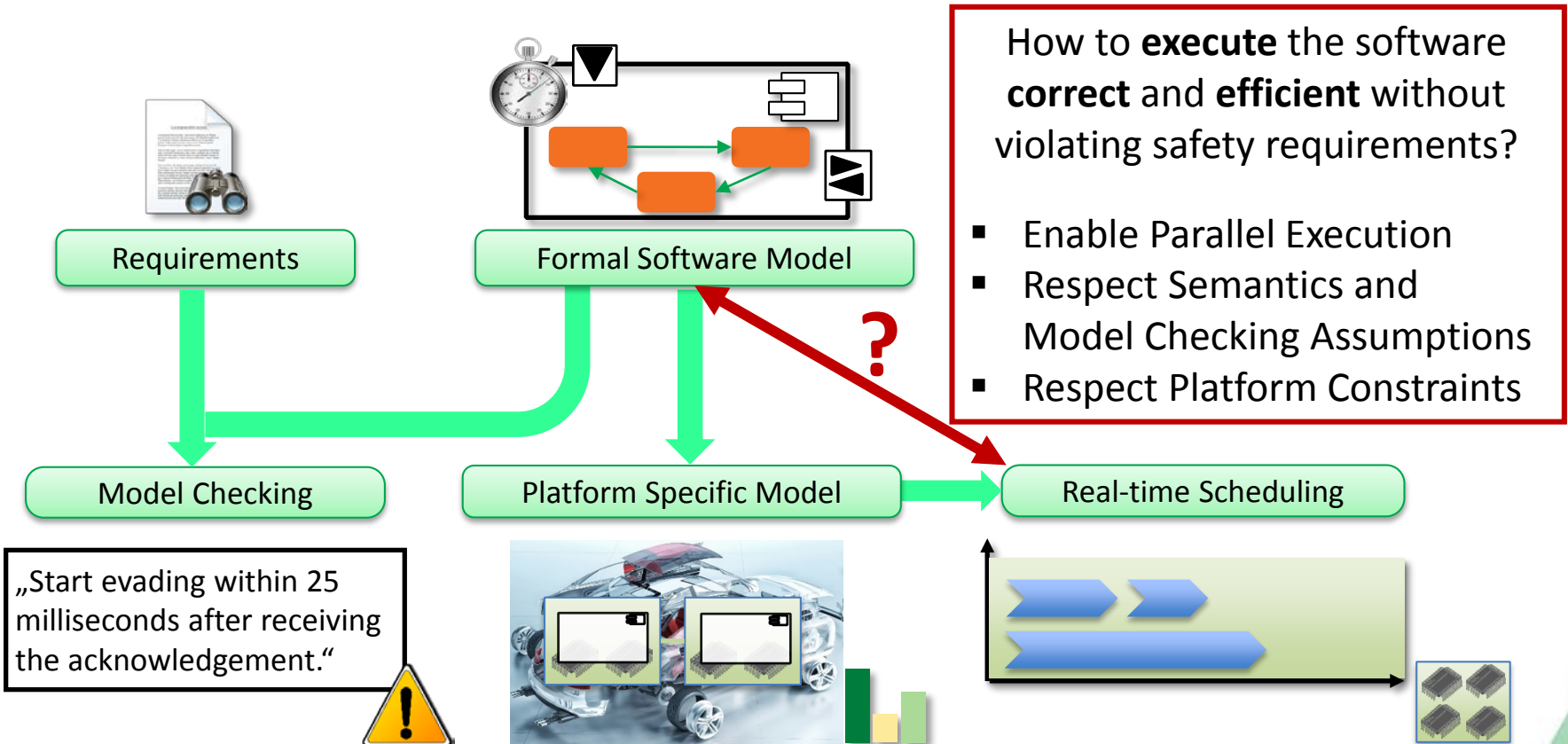
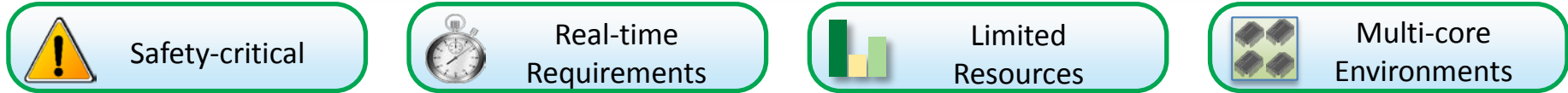
Scope of the demonstration

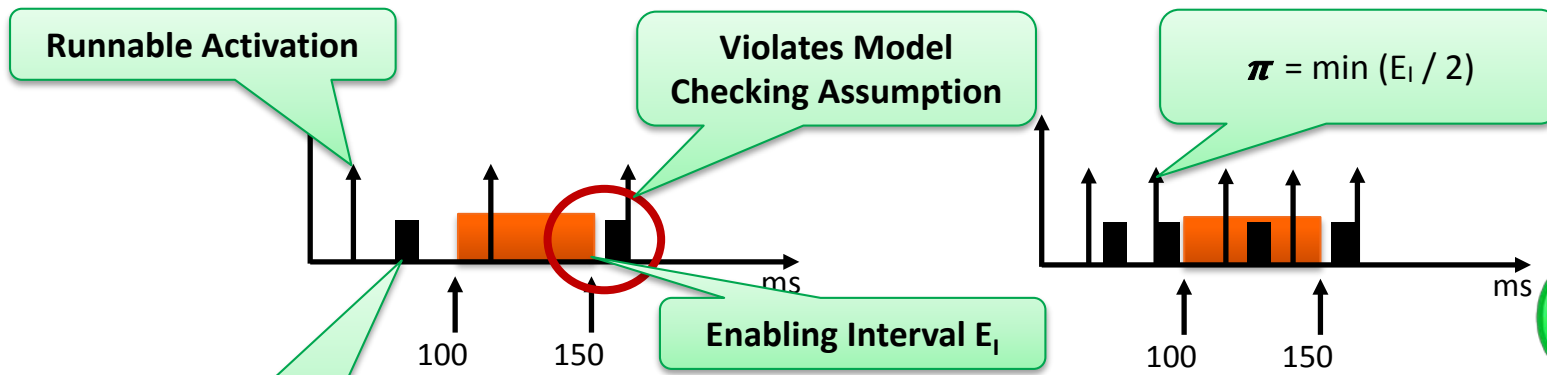
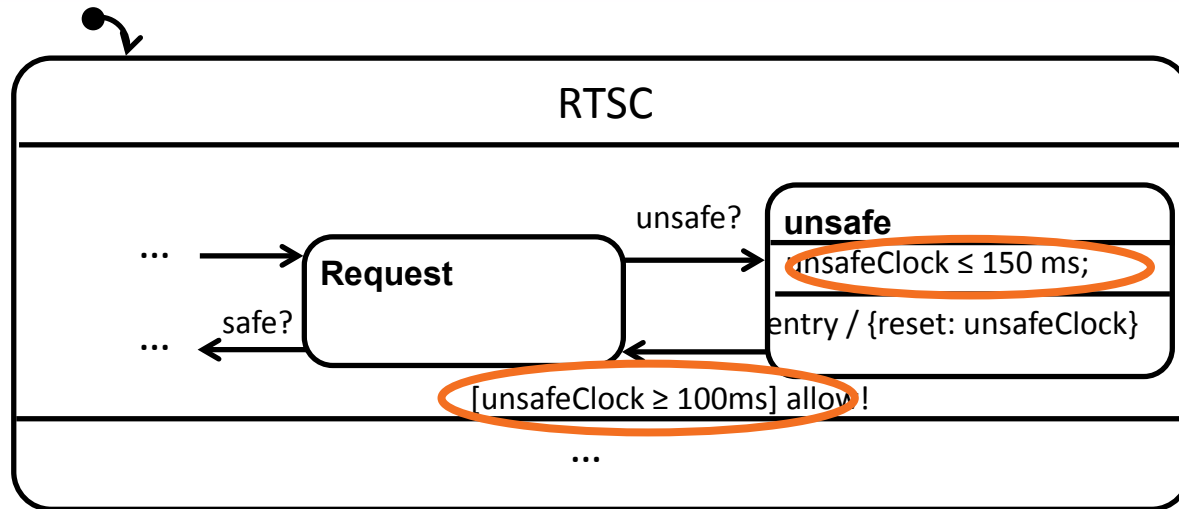
Model transformation M-UML → APP4MC



Scope of the demonstration

Model transformation M-UML → APP4MC





Contribution

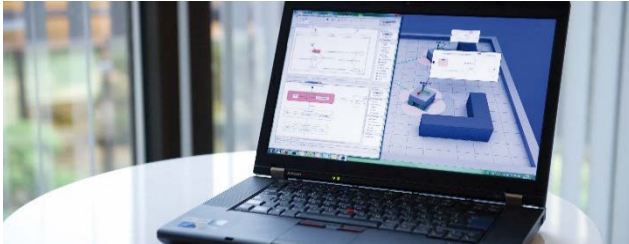
Automatic Computation of Runnable Period

Outlook

- EBEAS example
 - CONSENS models in Papyrus
 - Complete models in ScenarioTools and MechatronicUML
 - Deployment on the RC-Car / Rover (ambitious 😊)

- MechatronicUML → APP4MC transformation
 - Transformation of additional model elements: components, hardware
 - Utilization of component allocation information in Partitioning and Mapping

Contact information



David Schmelter
Research Fellow
Software Engineering
Phone: +49 5251 5465-272
david.schmelter@iem.fraunhofer.de



Fraunhofer IEM
Zukunftsmeile 1
33102 Paderborn, Germany
Phone: +49 5251 5465-101
Fax: +49 5251 5465-102
www.iem.fraunhofer.de

Contact information



Salome Maro

Phone: +46 31 772 6177
salome.maro@cse.gu.se



Jan-Philipp Steghöfer

Senior Lecturer
Phone: +46 31 772 1043
jan-philipp.steghofer@gu.se



CHALMERS
UNIVERSITY OF TECHNOLOGY



UNIVERSITY OF GOTHENBURG

Chalmers | University of Gothenburg
Department of Computer Science and Engineering
Software Engineering Division
<https://chalmers.se/cse>

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