

A Change Management Approach in Product Lines for Use Case-Driven Development and Testing

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Context & Problem Statement

1) Context

- Automotive domain: software development driven by standards
- Use case centric development and requirements-driven testing
- Evolution of requirements and test cases in a family of products

2) Problem Statement

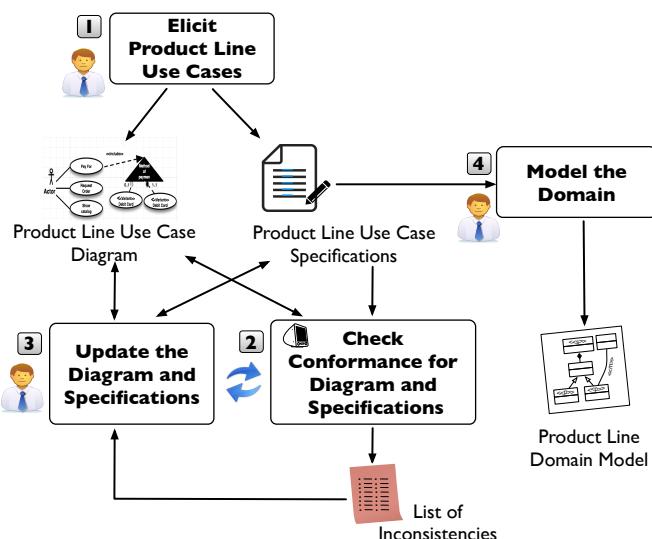
- Ad-hoc change management in the context of product lines

Project Goals

- A modeling method for capturing variability information in product line use case and domain models
- An automated configuration approach for product specific use case and domain models
- A change impact analysis approach for product line use case and domain models
- An automated regression test selection approach for product line use case and domain models

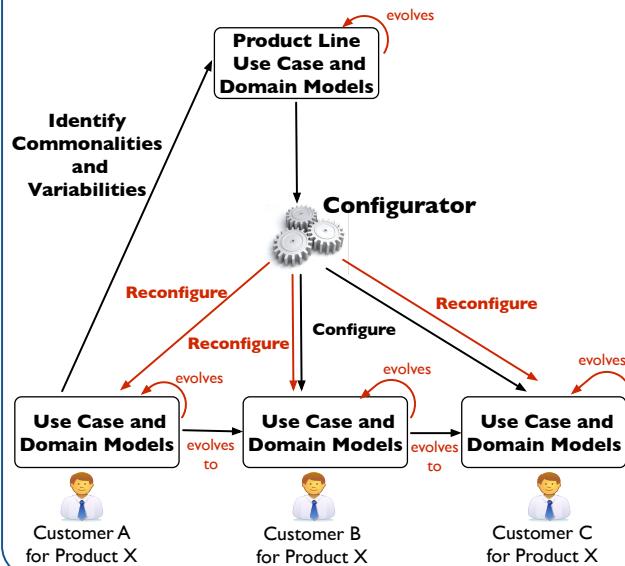
Product line Use case modeling Method: PUM

- Modeling variability** in product line use case and domain models
- Relying on **Natural Language Processing (NLP)** to **automatically** report inconsistencies between product line use case diagrams and specifications



Requirement Configuration Approach: PUMConf

- PUMConf guides stakeholders** in making configuration decisions in product line models and **automatically generates** product-specific use case and domain models



Current & Future Activities

- Change impact analysis for evolving configuration decisions
- Change impact analysis for evolving product line use case and domain models
- Automated regression test selection for test cases derived from use case models

Selected Publications

- I. Hajri, A. Goknil, L. C. Briand, and T. Stephany. **Incremental Reconfiguration of Product Specific Use Case Models for Evolving Configuration Decisions**. In REFSQ'17, pages 1-19, 2017.
- I. Hajri, A. Goknil, L. C. Briand, and T. Stephany. **A requirements configuration approach and tool for use case-driven development**. In Software and Systems Modeling Journal (SoSyM), Springer, 2016.
- I. Hajri, A. Goknil, L. C. Briand, and T. Stephany. **Applying product line use case modeling in an industrial automotive embedded system: Lessons learned and a refined approach**. In ACM/IEEE MODELS'15, pages 338–347, 2015.