Industry Example

HIS GX/QIS: Commercial product family of university management systems in Germany (145 product instances in 2012)

Provided ways to adapt individual products to universities:
1. Configuration: adaptation of database model (results in adding/removing UI elements), static content (e.g., text on the UI), style sheets (visual appearance)
2. Manual customization: detailed tweaking of UI code; mostly performed by universities themselves

Empirical Study: Types of Customizations in Practice
- Extraction and analysis of UI code from 30 running products
- Result: Various fine-grained customizations made in practice cannot be handled by existing mechanisms like style sheets

Model-driven Evolution of Software Product Lines

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Project Title: Model-driven Evolution of Complex Software-intensive Systems (ModEvo)

Focus here: Customization of user interfaces in families of interactive applications due to usability

In practice: Sometimes need for manual tweaking of generated code, e.g., for usability or performance
⇒ problematic for evolution (products can no longer just be re-generated after SPL has changed)

Empirical Study: Types of Customizations in Practice
- Extraction and analysis of UI code from 30 running products
- Result: Various fine-grained customizations made in practice cannot be handled by existing mechanisms like style sheets

Conclusion: There is a need for additional customization beyond style sheets

Evaluation

Basic Software Product Line (SPL) process

Evaluation

Manual customizations are stored in customization models
Products can be automatically re-generated after changes to the SPL without loss of customizations

Second part of the evaluation: support for evolution
1. Evolution of UI on SPL level
2. Automated re-generation of all 30 products

Result 1: all 30 customized UIs can be generated

30 real-world products customized by universities

Result 2: Changes on SPL level can be automatically propagated to all 30 products without loosing any customizations

References