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Simplify interactions with models in MDE through instrumentation of model-based applications

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Abstract: Since the adoption of Model-Driven Engineering (MDE), interaction with models has been an important question. The interactions with models are actually mainly provided via modeling tools which are complex. We propose an approach in which we make model modification actions (MMA) available on the user interface of generated applications by instrumenting these applications, in order to simplify interactions with models in MDE compilation chains. We also pay attention to simplicity during the instrumentation of applications.

Context

An MDE compilation chain composed of transformations, starting with *models* and ending with a *running application*. The interaction with models in MDE compilation chain is provided by modeling tools (StarUML, Gennymodel, Papyrus...) and modeling languages (general purpose languages and dynamic specific languages).

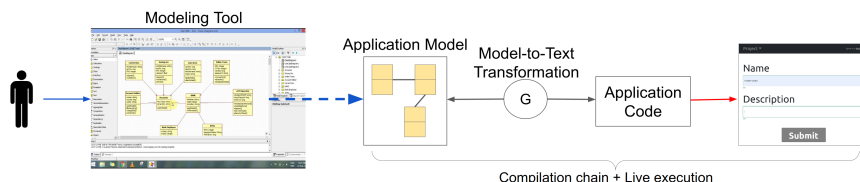


Figure 1: MDE compilation chain

Problems

Different problems are considered regarding our context:

- Long learning curve to master modeling languages
- Complexity of modeling tools

Proposal

MMA: Model Modification Actions

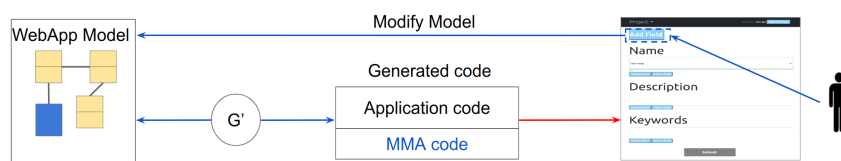


Figure 2: Interaction with models from end-user interface of the *running application* in **development mode**

Instrumentation

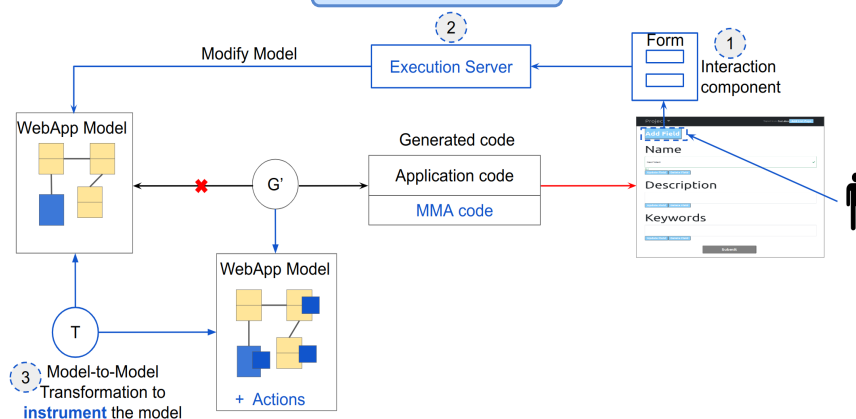


Figure 3: Instrumented compilation chain with main added components

Research directions

- How to simplify the mechanism of instrumentation of the compilation chain?
- What are the possibilities in terms of genericity in the conception of MMA Metamodel?
- In the instrumentation mechanism, which kind of interaction component can we offer, other than "forms"?

Perspectives

- Automatic update of MMA model when the original model is updated.
- Genericity of MMA to instrument every kind of artifact, not only user interfaces (IHM), and also to propose other interaction components.
- Digital twins of web applications: *running application* as *original system* and instrumented application as *twin* with actions to simulate some changes.