Towards a Structured Workflow Language for Model Management

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The Problem
1. Need for workflows in MDE.
2. Workflows should be modelled.
3. Models of workflows should be structured.
4. Workflow models should use the appropriate modeling primitives [1].
5. Traceability mappings first class citizens.
6. Verification and Validation of Workflows.

The Solution: Structured Workflows for Model Management

Figure 3: Structured Workflow

Switching Abstraction Levels

Figure 4: Zooming into the “transform” operation

Typing System

Figure 5: Operation Types

The Expected Contributions
1. A structured specification of megamodels:
   • Models and mappings as first class citizens modelled via graphs and graph mappings.
   • Constraints on them modelled via diagram predicates.
   • Operations over them modelled via diagram operations.
2. A workflow language for model management that is built via the composition (tiling) of diagram operations.
3. Workflow comparison and optimization.
4. Evaluation of the workflow language and a set of suggested improvements to the state-of-the-art in the area of workflows for model management.

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References

An Example
Requirement: "I have two models: M1 and M2. I would like to merge them and then generate code from the result. I would then like to trace back to see what part of the code came from M1."

The State of the Art
Issues identified in the state-of-the-art of workflow languages for model management:
• Modeling
  • not all workflows are modelled
  • Expressiveness
  • sequential composition only
  • transformations are the only model management operation considered
• Traceability
  • non-existent or implicit
• Verification and Validation
  • focus on execution and not V&B

The Workflow Language
• Signature of model management operations SMM:
  • Transform, Merge, Match, Intersect, etc.
• Signature of workflow combinators Sc:
  • ; || , Branching, etc.
• Workflow is then a term constructed from SMM and Sc. E.g.,
  W = (Match ; Merge ; Transform ; Intersect)