

Abstract

Dynamic Meta Modeling —A Semantics Specification Technique for Visual Modeling Languages

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The technique of Dynamic Meta Modeling allows for specifying the semantics of visual modeling languages (like, e.g., the Unified Modeling Language, UML). It is aimed at combining formal rigor (allowing for automated processing of expressions in the language and reasoning about them) with a user-friendly visual notation. We do explicitly exploit the meta modeling paradigm to provide our formalizations within a form known to the expected user base.

Technically, DMM uses an innovative combination of elements from denotational and operational semantics together with Graph Transformations. The thesis furthermore introduces a technically richer concept of relations to the Meta Object Facility (MOF).

As an extended application example the core semantics of UML Activity Diagrams are formalized within this thesis. Pragmatic guidelines to formulate specifications in DMM and tool support to test the effect of such specifications complete the thesis.