# Preamble – Methodical Development of Modelling Tools

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The concept of "model" plays a key role in many areas of life and scientific research. Models capture and convey a specific kind of knowledge and can be represented in a variety of occurrences. Correspondingly, the term is used in different ways, applied to different purposes and meant to denote different subject matter. Historically, the origin of the concept is derived from the Latin "modulus" and the traditions of architecture, where the word "Modello" can be traced back to early medieval times.

Children's toys as miniatures of cultural objects are common since the beginning of mankind, just like architecture models and other reproductions of real objects. Besides physically scaled-down replica, the idea of a "model" can also denote conceptual artefacts. In the first half of the 20th century, abstractions of the concept of a physical model entered natural sciences and humanities. Since then we refer to, e.g., the atomic model, the DNA model, models of human evolution, socialisation models or semiotic models in various scientific disciplines.

For information sciences such as Computer Science, Informatics or Business & Information Systems Engineering, models are of importance in two respects: On the one hand, models are a key instrument applied to represent formal descriptions of software systems at the instance level. On the other hand, scientific interest on models pertains to the reflection about modelling techniques and the design of modelling methods to make the act of modelling more efficient and to add to the semantic expressiveness of modelling languages. This rather methodological perspective represents a genuine task of the information sciences, and theoretic reflection about modelling methods is considered one of their main fields of research.

However, each research activity in this field must make a fundamental assumption representing a necessary precondition to scientific modelling research and to practical modelling projects: Namely that a modelling language can be efficiently applied. The question of efficient applicability of a modelling language not only refers to the cognitive, psychological aspects in the sense of comprehensibility and intellectual manageability. It also presupposes the availability of a (computer-based) modelling tool. Without such a tool, a modelling language cannot be beneficially put to use. The proceedings of the workshop "Methodical Development of Modelling Tools" comprises four papers devoted to this field

of research. The four contributions highlight different aspects relevant to developing modelling tools.

The paper “Entwurf domänenspezifischer Modelle im Web mit Oryx” (Design of domain-specific models on the Web with Oryx) discusses a Web-based approach characterised by its innovative technological realisation inside a Web browser. The tool directs the view towards potential future developments in modelling research and reveals that present approaches are not the end of technological developments.

“An Eclipse-Framework for Rapid Development of Rich-Featured GEF Editors based on EMF Models” presents a method for generating graphical editors in the context of the Eclipse Modeling Framework (EMF) and the Eclipse Graphical Editing Framework (GEF), and thus offers an alternative methodical approach to the widespread Graphical Modeling Framework (GMF). The presented research operates with a mapping-technique between the semantic conceptual model and graphical symbolic notation, introducing essential enhancements into model notation.

In the article “A Domain Specific Language for Project Execution Models”, the development process of a a domain specific modelling language is precisely reconstructed, and challenges and solutions arising during the exemplified language development are methodically presented. This way, the article conveys a traceable methodological overview on the development process of a domain specific modelling language.

“Minimal-invasive generative Entwicklung von Modellierungswerkzeugen mit dem Eclipse Graphical Modeling Framework (GMF)” (Minimal-invasive generative development of modelling tools with the Eclipse GMF) investigates the problem of applying manual changes to source code automatically generated by a modelling tool. The paper suggests a procedure which methodically unifies the transformation of models to source code considering the creation of manual modifications.

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