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Special Issue on Design, Implementation and Evaluation of Modelling Tools

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Editorial Preface

Modelling tools support modellers in constructing, documenting, and maintaining conceptual models and provide functionality for model management. Meta modelling tools supply method and language designers with an infrastructure for method and language implementation including means for implementing modelling tools (e.g., graphical editors). Both modelling and meta modelling tools play a prominent role in model-based software development, and gain in importance in the light of domain-specific modelling, model-based analyses and decision-making. Referring to the economics of modelling, modelling tools represent a prerequisite to the effective and efficient use of modelling methods and languages. In addition to that, modelling tools open a new perspective on sophisticated management support systems that enable advanced users not only to navigate to the conceptual models their analyses are based on but also to modify these models. In this respect, modelling tools are widely regarded as a complementary yet pertinent subject in conceptual modeling research. Yet, surprisingly few scientific publications have so far dealt with the design, implementation and evaluation of modelling tools. We therefore dedicated this special issue to the current state-of-the-art in modelling tool research. The Dagstuhl seminar on 'Open Models as a Foundation of Future Enterprise Systems' and the workshop series on 'Methodical Development of Modelling Tools'[1] served as starting points for getting the special issue underway. Four papers were finally accepted for publication as a result of a double-blind review process.

The articles in this special issue approach modelling tool research from differing yet complementing angles, and, thus, demonstrate the spectrum of work in this research area. Hans-Georg Fill and Dimitris Karagiannis take an in-depth look into the implementation of a modelling method using the ADOxx meta modelling tool. They describe the meta modelling infrastructure provided by ADOxx including the meta modelling language and essential concepts related to tool support. The paper highlights four essential aspects of tool support, i.e., visualisation of models, model transformations, model-based simulations, and queries on models. Florian Matthias, Christian Neubert, and Alexander W. Schneider present a modelling tool, termed 'Hybrid Wiki', to address essential barriers to communication and collaboration in Enterprise Architecture endeavours. The tool is based on the concept of a Wiki page with extensions for collaborative modelling. Results of a survey and an industry case study suggest that the tool lowers barriers to communicate and to collaborate. Tony Clark and Balbir Barn introduce an approach to enterprise architecture modelling called LEAP, and show how its modelling language and corresponding modelling tool address open issues in requirements modelling. Building on goal-oriented requirements engineering approaches such as KAOS, the LEAP architecture modelling language adds operational semantics to express behavioural and non-functional goals. The paper reports on the language specification, tool design and implementation, and describes how the operational semantics are implemented. Marco Kuhrmann, Georg Kalus, and Alexander Knapp discuss PDE, a meta modelling toolset for developing domain-specific languages (DSL), and present a stepwise procedure for DSL development based on PDE. The toolset facilitates language design by reconstructing DSL elements from prototypical models drawn by domain experts in a process described as 'instance modelling'. The principal ideas behind PDE are discussed and illustrated by examples. The research articles in this issue are complemented by a report on the workshop 'Security in Business Processes' provided by the workshops organizers, Rafael Accorsi and Raimundas Matulevičius.

[1] http://www.wi-inf.uni-due.de/MeDMoT2013

We would like to thank Jens Gulden for his comments on the call for papers and for providing us with insights into the modelling tool research community. Our thanks also go to the reviewers involved in this special issue and to the authors of all submissions. The readers of this special issue may gain inspiring insights into modelling tool research.

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