Foreword

Conceptual modeling often is considered to be at the heart of the Business and Information Systems Engineering discipline. Without conceptual modeling, it would be extraordinarily costly and time-consuming, if not impossible, to communicate concepts, structures and artifacts of a project domain between a larger number of team members and to finish a project successfully and efficiently. Graphical modeling languages are the key instruments of conceptual modeling and are widely used not only throughout most diverse kinds of software projects, but also in process management, quality management or compliance management projects.

Compared to its central importance, surprisingly little is known about the usability evaluation of modeling languages. Graphical modeling languages are invented and developed by persons, teams or organizations, often based upon prior concepts, and can evolve into being a certified or a de facto industry standard. But during these development processes, usability evaluations are not yet common. Thus it often remains unclear, when a language should be chosen for a given project task, what intellectual and practical skills the use of the concepts and elements of the language requires, or which aspects influence the content and the quality of models developed. Still, these questions are of considerable relevance for the success of modeling tasks in organizational practice.

Christian Schalles investigates and sheds light on this exciting and important, however rather neglected field of research. For this purpose he examines the variables that influence the usability of modeling languages. His inquiry not only brings together conceptual arguments, but is also driven by empirical research. In an innovative way, the usability evaluation concept presented in this book combines approaches from different disciplines. Relevant usability attributes are derived from literature; metrics and a framework for evaluation are developed; hypotheses are formulated and tested empirically. Thus, usability evaluation of graphical modeling languages is put on a sound basis.
The book not only widens and enhances research about modeling languages and sets an agenda for future investigation. It is also of immediate use for developers of graphical modeling languages, as it contains recommendations for the refinement of existing languages or the development of new ones – wherever this, despite the plethora on hand, may still be necessary. It is also useful for business practice, as it provides a decision framework that helps project managers to determine the appropriate modeling language for a given application context. I hope that the book will be well received by the different audiences it addresses and that it spurs many fruitful discussions in research teams, standardization bodies, public administrations and businesses.

Prof. Dr. Michael Rebstock

June, 2012
Foreword

This thesis explores the usability of modeling languages used in both software development and business processes. A Framework for Usability Evaluation of Modeling Languages (FUEML) is developed, followed by a series of investigations based on FUEML.

This research into the usability of modeling languages has significant implications for the future evolution of modeling languages both in software development and business processes. With a greater understanding of user experiences, software tools may present an environment for model development and interpretation that leads to greater efficiency and effectiveness.

The overall approaches taken by this research in the development of a framework may be a beneficial approach for many other areas where usability is important.

The Department of Computing at the Cork Institute of Technology, Ireland (CIT) has a long established collaboration with the University of Applied Sciences in Darmstadt.

This Ph.D. thesis was successfully completed by Christian Schalles, under the supervision of Dr. John Creagh, Department of Computing, CIT, and Prof. Dr. Michael Rebstock, Faculty of Business Administration and Economics, Darmstadt

I wish to express my gratitude to the Cork Institute of Technology and the University of Applied Sciences Darmstadt.

Dr. John Creagh
Cork Institute of Technology June, 2012
Usability Evaluation of Modeling Languages
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2013, XXIII, 183 p., Softcover
ISBN: 978-3-658-00050-9