

Preface

The book you have in front of you is the synthesised result of several research projects executed at the Energy and Industry (E&I) group, part of the faculty of Technology, Policy and Management of the Delft University of Technology in the Netherlands. Since 2004, the E&I group uses the agent-based paradigm to develop socio-technical models of infrastructure systems and services and their evolution. The researchers soon realised that we could be more efficient by working together and building on top of each other's models, but also that the reality of today's socio-technical systems requires a complex systems approach which allows us to explicitly capture the multi-disciplinary nature of infrastructures, industrial systems and services.

While many elements of our work have been published in PhD theses, book chapters, journals and proceedings of international conferences, until now there was no single resource which described our common view, presented the methodology which emerged from our work, and collected the lessons learned modelling as a team. In this volume we have collected the background, theory and practical steps and brought them together with a number of inspiring case studies that show how this approach works in practice and how such models can support decision-making.

All authors who contributed to this book played an important role in developing, crystallising and testing the methodology. So first of all, we would like to thank them for their valuable contributions and for sharing their experience. Furthermore, we would like to thank the Next Generation Infrastructures Foundation and the Delft University of Technology for the financial support of our research projects and for making it possible to write this book. As editors we are more than grateful for the support we received from Deborah Sherwood in proofreading and language editing the texts.

Finally, one small comment about the use of the word *agent*. We consider an agent to be a *representation* of a decision-making entity in the real world, be it an individual or an organisation, and it is a stylised part of the model. As such, throughout this book we have referred to an agent as 'it' rather than with a personal pronoun.

We hope students, researchers and business professionals using this book will appreciate the theoretical base and practical guidelines for developing agent-based models and that it will help successfully cope with the complexities of the design and management of socio-technical systems.

Delft, the Netherlands

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