

Preface

The standardisation for complex systems and their interfaces has become more and more important in the last years; particularly due to the rapid development in the information and communication technologies. This development influences several domains in society and industry, like the Active Assisted Living (AAL), Smart Home/Building, Smart Grid, Smart City, Industrie 4.0 as well as the maritime sector. For this purpose, a standardised and holistic approach of requirements engineering for Smart Grid projects based on work conducted within the M/490 standardisation mandate from the European Commission has been developed. Over the last few years, this method has been established rapidly in Europe as the basic building block in the very scope of requirements engineering in the utilities sector with a focus on the operational technology. Based on the outcomes of the energy sector, this approach developed through the support of OFFIS – Institute for Information Technology has been standardised as the IEC 62559 series which describes a use case methodology for the requirements engineering of complex systems.

The authors present a canonical, structured way for users to apply these methods from international standardisation alongside a use case management repository and a three-dimensional visualisation for (Smart Grid) architecture models, which are provided as open software tools. The implementation of these tools has been done in the German project UC4AAL funded by the German Federal Ministry for Economic Affairs and Energy under grant agreement No. 01FS13028, and the European project DISCERN – Distributed Intelligence for Cost-effective and Reliable Solutions funded by the European Union Seventh Framework Programme under grant agreement No. 308913.

This book provides an introduction to the very fundamentals of the IEC 62559 Use Case Methodology, how it is related to the Smart Grid Architecture Model (SGAM), and how a holistic view for both, requirements engineering and architecture, can be achieved. In addition, the application in various domains outside the Smart Grid is motivated as the method can be applied to critical infrastructures or cyber-physical systems (CPS), respective system-of-systems (SoS) like AAL and Industrie 4.0 domains as well.

The authors hope that this book is useful as introduction in the overall Use Case Methodology and the application of architecture models for reference designation as well as a Use Case Management Repository in many prospective projects.

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The Use Case and Smart Grid Architecture Model
Approach

The IEC 62559-2 Use Case Template and the SGAM
applied in various domains

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