

Essential Model-Based Systems Engineering – Applied and Practical

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Abstract. Combine the key concepts of MBSE with the essentials of their practical application. This tutorial is designed help you leverage model-based techniques to better meet the engineering challenges of analyzing stakeholder needs and defining system solutions. The tutorial uses a practical top-down system analysis and design example and exercise to explore the application of layered model-based systems engineering (MBSE) to system definition challenges. It examines the range of views available to the systems engineer for understanding and communicating design choices and provides a practical introduction to constructing the model and generating each representation. As the analysis and design advances, the engineer will use a wide variety of views drawn from traditional and SysML representations to portray aspects of the model and gain understanding of stakeholder concerns and the design choices to be made. This tutorial works for both new and experienced systems engineers, capability analysts and others working on an integrated project team, and program/project/capability managers. While a basic understanding of the systems engineering process is assumed, the MBSE framework and approach provide the foundation for those not experienced in systems engineering. The detailed discussion of MBSE methodology and model representations including SysML and traditional SE products delivers value for all but the most experienced model-based systems analysts and engineers. This is an MBSE methods, models, and representations tutorial, not a tool tutorial. The focus is on the practical application of essential MBSE for project success. The concepts taught and methods shared are applicable regardless of the systems engineering tools the attendee may choose.

Biography

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Warren Smith has worked as a program manager, field engineer, instructor, and entrepreneur. But above all over the last 25 years, Smith has been a systems engineer. In the early 1990s, when Smith first taught University of California classes to the professionals of Silicon Valley, he focused on object-oriented systems analysis. These classes followed his role as the lead systems engineer on the Army's first program using object-oriented SE. Notationally, the Jacobson, Rumbaugh, and Booch methods evolved into SysML's use case, activity, sequence, and block definition diagrams. In the mid-1990s, Smith explored the power unlocked by the SE model by deploying modeling tools to scores of companies, teaching tool and methodology classes along the way. In 2001, Smith launched a SE company, building systems models and deploying MBSE. He pioneered re-use methodologies and requirements elicitation & analysis using storyboards. His teams performed hundreds of behavioral analyses using agile SE techniques. Smith recently joined the team at Vitech – a pioneer in the development and application of MBSE – to support SE activities throughout the southern US. While he has worked on systems from military to space to medical and IT, Smith says working on amusement park rides was the most fun!