SysML Distilled: A Brief Guide to the Systems Modeling Language

By Lenny Delligatti

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The Systems Modeling Language (SysML) extends UML with powerful systems engineering capabilities for modeling a wider spectrum of systems and capturing all aspects of a system's design.   *SysML Distilled* is the first clear, concise guide for everyone who wants to start creating effective SysML models.

(Drawing on his pioneering experience at Lockheed Martin and NASA, Lenny Delligatti illuminates SysML's core components and provides practical advice to help you create good models and good designs. Delligatti begins with an easy-to-understand overview of Model-Based Systems Engineering (MBSE) and an explanation of how SysML enables effective system specification, analysis, design, optimization, verification, and validation. Next, he shows how to use all nine types of SysML diagrams, even if you have no previous experience with modeling languages. A case study running through the text demonstrates the use of SysML in modeling a complex, real-world sociotechnical system.

Modeled after Martin Fowler's classic UML Distilled, Delligatti's indispensable guide quickly teaches you what you need to know to get started and helps you deepen your knowledge incrementally as the need arises. Like SysML itself, the book is method independent and is designed to support whatever processes, procedures, and tools you already use.

Coverage Includes

- Why SysML was created and the business case for using it
- Quickly putting SysML to practical use
- What to know before you start a SysML modeling project
- Essential concepts that apply to all SysML diagrams
- SysML diagram elements and relationships
- Diagramming block definitions, internal structures, use cases, activities, interactions, state machines, constraints, requirements, and packages
- Using allocations to define mappings among elements across a model
- SysML notation tables, version changes, and sources for more information

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Editorial Review

Review
"In keeping with the outstanding tradition of Addison-Wesley's technical publications, Lenny Delligatti's *SysML Distilled* does not disappoint. Lenny has done a masterful job of capturing the spirit of OMG SysML as a practical, standards-based modeling language to help systems engineers address growing system complexity. This book is loaded with matter-of-fact insights, starting with basic MBSE concepts to distinguishing the subtle differences between use cases and scenarios to illumination on namespaces and SysML packages, and even speaks to some of the more esoteric SysML semantics such as token flows."

–Jeff Estefan, Principal Engineer, NASA's Jet Propulsion Laboratory

"The power of a modeling language, such as SysML, is that it facilitates communication not only within systems engineering but across disciplines and across the development life cycle. Many languages have the potential to increase communication, but without an effective guide, they can fall short of that objective. In *SysML Distilled* , Lenny Delligatti combines just the right amount of technology with a common-sense approach to utilizing SysML toward achieving that communication. Having worked in systems and software engineering across many domains for the last 30 years, and having taught computer languages, UML, and SysML to many organizations and within the college setting, I find Lenny's book an invaluable resource. He presents the concepts clearly and provides useful and pragmatic examples to get you off the ground quickly and enables you to be an effective modeler."
–Thomas W. Fargnoli, Lead Member of the Engineering Staff, Lockheed Martin

"This book provides an excellent introduction to SysML. Lenny Delligatti's explanations are concise and easy to understand; the examples well thought out and interesting."
–Susanne Sherba, Senior Lecturer, Department of Computer Science, University of Denver

"Lenny hits the thin line between a reference book for SysML to look up elements and an entertaining book that could be read in its entirety to learn the language. A great book in the tradition of the famous *UML Distilled*."
–Tim Weilkiens, CEO, oose

"More informative than a PowerPoint, less pedantic than an OMG Profile Specification, *SysML Distilled* offers practicing systems engineers just the right level of the motivation, concepts, and notation of pure OMG SysML for them to attain fluency with this graphical language for the specification and analysis of their practical and complex systems."
–Lonnie VanZandt, chief architect, No Magic, Inc.

"Delligatti's *SysML Distilled* is a most aptly named book; it represents the distillation of years of experience in teaching and using SysML in industrial settings. The author presents a very clear and highly readable view of this powerful but complex modeling language, illustrating its use via easy-to-follow practical examples. Although intended primarily as an introduction to SysML, I have no doubt that it will also serve as a handy reference for experienced practitioners."
–Bran Selic, president, Malina Software Corp.

"SysML is a rather intimidating modeling language, but in this book Lenny makes it really easy to

understand, and the advice throughout the book will help practitioners avoid numerous pitfalls and help them grasp and apply the core elements and the spirit of SysML. If you are planning on applying SysML, this is the book for you!"
–Celso Gonzalez, senior developer, IBM Rational

" *SysML Distilled* is a great book for engineers who are starting to delve into model-based systems engineering. The space system examples capture the imagination and express the concepts in a simple but effective way."
–Matthew C. Hause, chief consulting engineer, Atego and chair, OMG UPDM Group

"I've been deeply involved with OMG since the 1990s, but my professional needs have not often taken me into the SysML realm. So I thought I'd be a good beta tester for Lenny's book. To my delight, I learned a great deal reading through it, and I know you will too."
–Doug Tolbert, distinguished engineer, Unisys, and member, OMG Board of Directors and Architecture Board

" *SysML Distilled* provides a clear and comprehensive description of the language component of model-based systems engineering, while offering suggestions for where to find information about the tool and methodology components. There is evidence throughout the book that the author has a deep understanding of SysML and its application in a system development process. I will definitely be using this as a textbook in the MBSE courses I teach."
–J. D. Baker, OCUP, OCSMP, member of the OMG Architecture Board

" *SysML Distilled* is the desktop companion that many SysML modelers have needed for their bookshelves. Lenny has the experience and certifications to help you through your day-to-day modeling questions. This book is not a tutorial, nor is it the encyclopedic compendium of all things SysML. If you model using SysML, this will become your daily companion, as it is meant to be used regularly. I believe your copy will soon be dog-eared, with sticky notes throughout."
–Dr. Robert Cloutier, Stevens Institute of Technology

"SysML is utilized today in a wide range of applications, including deep space robotic spacecraft and down-to-earth agricultural equipment. This book concisely presents SysML in a manner that is both refreshingly accessible for new learners and quite handy for seasoned practitioners."
–Russell Peak, MBSE branch chief, Aerospace Systems Design Lab, Georgia Tech

" *SysML Distilled* is a wonderfully written, knowledgeable, and concise addition to systems modeling literature. The lucid explanations lead a newcomer by the hand into modeling reasonably complex systems, and the wealth and depth of the coverage of the most-used aspects of the SysML modeling language stretch to even enabling advanced intermediate depictions of most systems. It also serves as a handy reference. Kudos to Mr. Delligatti for gifting the world with this very approachable view of systems modeling."
–Bobbin Teegarden, CTO/chief architect, OntoAge and Board Member, No Magic, Inc.

About the Author
Lenny Delligatti holds the OMG Certified Systems Modeling Professional (OCSMP): Model Builder Advanced certification. As a senior systems engineer with Lockheed Martin, he created SysML models for NASA's Mission Control Center: 21st Century (MCC-21) project at Johnson Space Center. Lenny is a member of the Object Management Group (OMG) SysML Revision Task Force (RTF). He has delivered hundreds of hours of training to hundreds of systems and software engineers, enabling many to earn certifications and lead MBSE projects.

Users Review

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Ida Hamilton:

Book is definitely written, printed, or descriptive for everything. You can learn everything you want by a guide. Book has a different type. As we know that book is important factor to bring us around the world. Adjacent to that you can your reading expertise was fluently. A publication SysML Distilled: A Brief Guide to the Systems Modeling Language will make you to always be smarter. You can feel more confidence if you can know about every little thing. But some of you think which open or reading a book make you bored. It isn't make you fun. Why they could be thought like that? Have you in search of best book or acceptable book with you?

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Harriet Blum:

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Daniel Hanson:

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