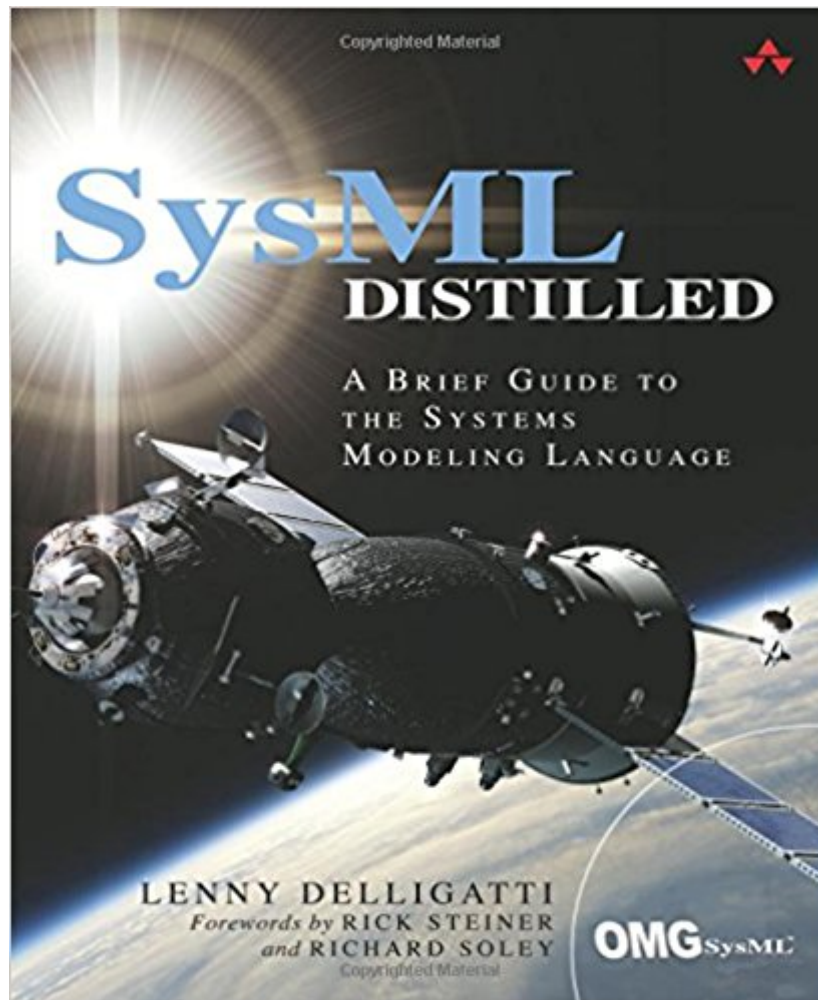




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# SysML Distilled: A Brief Guide To The Systems Modeling Language



## Synopsis

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

## Book Information

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## Customer Reviews

“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.

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.

I highly recommend SysML Distilled to anyone learning the language and/or preparing for the first level of the Certified System Modeling Professional (CSMP) exam. This book provides a great overview of the language and can serve as a fine desk reference for experienced modelers. After introducing the “Three Pillars of MBSE” (languages, methods, and tools) it wisely focuses on the SysML language, which is the subject of the CSMP-User exam. The book’s organization reflects the structure of the SysML language. While each kind of diagram has a dedicated chapter, I really appreciated how a single recurring example – the design of the “DellSat-77” satellite – was used to build upon the techniques and insights developed in previous chapters. The book was just right for me, an almost breezy 250 pages, including copious diagrams. Thanks to skillful editing and a conversational writing style, it’s an enjoyable read that provides just enough theory without getting bogged down by abstractions. With moderate effort, in about a week you’ll gain a well-rounded appreciation for SysML that positions you for further study. For those interested in further study, the author points the way with plenty of references for alternative languages (e.g., UML, UPDM, BPMN, MARTE, SoaML), as well as for popular modeling methodologies (OOSEM, SYSMOD, or IBM Telelogic Harmony-SE) and tools

(Cameo, Rhapsody, Enterprise Architect, Modelio, et al). I'm familiar with most of the previous SysML books on the market. While no single book or reference can completely prepare you for the CSMP exam, I would highly recommend this book as your starting point. Note: as of this writing, the publisher offers free access to the Safari online version for 45 days.

I bought the Kindle version, after purchasing the paper version last year. Excellent reference to quickly find the most popular features of the language. Concise and accurate, and much easier to follow and understand than other books in the market. A perfect guide for those pursuing certification, and at the same time to keep a copy at the side of your computer. This book is a great introduction to the elements and relations of the language. As most practitioners can assess, there is still a lot more to learn besides learning the fundamentals. It is my wish that the author follows up this excellent book with a second one, a guide for the construction of a SysML model, suggesting best practices. I know this is a big challenge: this is a subject where one size doesn't fit all... If you are a beginner, don't hesitate to consider this book as your introduction and reference. This book is the reference material of a 14 sessions webinar that the author is currently offering.

I found this book a perfect introduction to SysML, both in terms of its content and structure. Having no background or experience, I needed something that would get me up and running as quickly as possible. This book was recommended by colleagues as a book that, not only would get you up to speed, but would be the first point-of-call, as a desktop reference. This has turned out to be true. The book's first two chapters introduce, in a straightforward and concise way, an overview of MBSE, the three pillars (Language, Methodology, Tool) and an overview of the SysML language. And, while this book clearly points out its focus is the language, it provided me enough information on the remaining two pillars, to get my research in those two areas going as well. The remainder of the book has a chapter focussing on each of the nine SysML diagrams, covering not only how to do but it also provides insight into when and why they are used. This book uses a consistent model (The DellSat-77 Satellite System) throughout to explain the SysML diagrams, which I found especially helpful in reinforcing the concepts being presented. You can even download the model in either magicdraw or xml format, which I also found useful in finding my way around the tool I was learning. In summary, I believe this book has provided me with a solid introduction to SysML and I have no hesitation in recommending it to others.

Though I have done a lot of programming in the past (mostly in computational mechanics), I am just

a beginner with SysML. This book has been quite helpful to me in general. I have found it to be a very good, compact reference that explains important points/features quite well - which is no easy feat. I have done a lot of graduate level teaching in the past and presently I teach short courses on involved technical subjects. The author of this book is an exceptional teacher with a lot of experience and a real expert in the subject. That is very clear to me. There are other good references that are much larger and cover much more ground, with more examples, etc. But sometimes they tend to be more of a collection of features of the language. This one, however, is well written and clear. I only wish it was a bit longer with more detailed examples. That being said SysML Distilled is a solid reference in general and I am glad I have it.

SysML Distilled is a very well-written book that gives a very good introduction to systems modeling and the SysML language in simple terms that are easy to understand. Lenny Delligatti organized and explained the modeling concepts in a logical format and reinforced those concepts by repeating them throughout the book. The book is written in a way that makes it easy to create questions and answers for studying. Simple diagrams are used often, and more complex diagrams are provided to bring together the simple ones in a realistic view. I highly recommend starting with this book before reading the more complex books written by engineers, not educators, to get a solid understanding of the key principles and elements of systems modeling using SysML. I would also encourage you to take advantage of his free online training module.

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