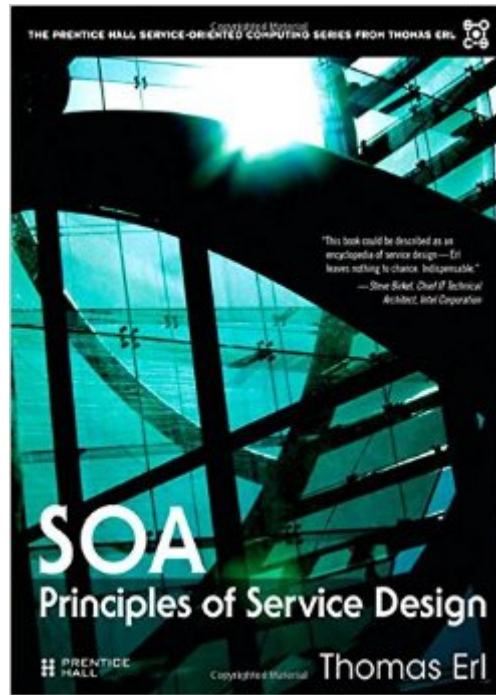


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# SOA: Principles Of Service Design



## Synopsis

“This book could be described as an encyclopedia of service design. Erl leaves nothing to chance. Indispensable.” — Steve Birkel, Chief IT Technical Architect, Intel Corp. “An absolute pleasure to read — the best SOA book I’ve read. A book I would recommend to all of my colleagues; it provides much insight to the topics often overlooked by most books in this genre — the visuals were fantastic.” — Brandon Bohling, SOA Architecture and Strategy, Intel Corporation “This book is a milestone in SOA literature. For the first time we are provided with a practical guide on defining service characteristics and service design principles for SOA from a vendor-agnostic viewpoint. It’s a great reference for SOA discovery, adoptions, and implementation projects.” — Canyang Kevin Liu, Principal Enterprise Architect, SAP Americas, Inc. “I liked this book. It contains extremely important material for those who need to design services.” — Farzin Yashar, IBM SOA Advanced Technologies “This book does a great job laying out benefits, key ideas and design principles behind successfully adopting service-oriented computing. At the same time, the book openly addresses challenges, risks and trade-offs that are in the way of adopting SOA in the real-world today. It moves away from ivory-tower views of service orientation, but still lays out a strong vision for SOA and outlines the changes necessary to realize the full potential.” — Christoph Schittko, Senior Architect, Microsoft “I recommend this book to any SOA practitioner who wishes to empower themselves in making service design real — gives readers the 360° view into service design [and] gives SOA practitioners the depth and understanding needed into the principles of SOA to assist in the design of a mature and successful SOA program.” — Stephen G. Bennett, Americas SOA Practice Lead, BEA Systems “SOA projects are most successful when they are based on a solid technical foundation. Well accepted and established design principles are part of this foundation. This book takes a very structured approach at defining the core design principles for SOA, thus allowing the reader to immediately applying them to a project. Each principle is formally introduced and explained, and examples are given for how to apply it to a real design problem. A ‘must read’ for any architect, designer or developer of service oriented solutions.” — Andre Tost, Senior Technical Staff Member, IBM Software Group “There are few references for SOA that give you the nuts and bolts and this one is at the top of the list. Well written and valuable as a reference book to any SOA practitioner.” — Dr. Mohamad Afshar, Director of Product Management, Oracle Fusion Middleware, Oracle Corporation “A thorough examination of the considerations of service design. Both seasoned SOA practitioners and those endeavoring to realize services can benefit from reading this book.” — Bill Draven, Enterprise Architect, Intel Corporation

• There are very few who understand SOA like Thomas Erl does! The principle centric description of service orientation from Thomas canonizes the underpinnings of this important paradigm shift in creating agile and reusable software capabilities. The principles, so eloquently explained, leave little room for any ambiguity attached to the greater purpose of SOA.

• “Hanu Kommalapati, Architect, Microsoft Corporation”

• “Outstanding SOA literature uniquely focused on the fundamental services design with thorough and in-depth study on all practical aspects from design principles to methodologies. This book provides a systematic approach for SOA adoption essential for both IT management and professionals.”

• “Robin Chen, PhD, Google, Inc.”

• “Thomas Erl’s books are always densely filled with information that’s well structured. This book is especially insightful for Enterprise Architects because it provides great context and practical examples. Part 1 of the book alone is worth getting the book for.”

• “Markus Zirn, Senior Director, Product Management, Oracle Fusion Middleware, Oracle Corporation”

• “A very clear discussion of the subject matter. Provides a good structure that facilitates understanding and readily highlights key points.”

• “Kareem Yusuf, Director of SOA Strategy and Planning, IBM Software Group”

• “I am very impressed. Comprehensive. Educative. This book helped me to step back and look at the SOA principles from broader perspective. I’d say this is a must-read book for SOA stakeholders.”

• “Radovan Janecek, Director R&D, SOA Center, Hewlett-Packard”

• “Very valuable guidance for understanding and applying SOA service design principles with concrete examples. A must read for the practitioner of SOA service design.”

• “Umit Yalcinalp, PhD, Standards Architect, SAP”

• “This book really does an excellent job of explaining the principles underpinning the value of SOA. Erl goes to great length to explain and give examples of each of the 8 principles that will significantly increase the reader’s ability to drive an SOA service design that benefits both business and IT.”

• “Robert Laird, IT Architect, IBM EAI/SOA Advanced Technologies Group”

• “This book strikes a healthy balance between theory and practice. It is a perfect complement to the SOA series by the author.”

• “Prakash Narayan, Sun Microsystems”

• “If you are going to be designing, developing, or implementing SOA, this is a must have book.”

• “Jason AJ Comfort Sr., Booz Allen Hamilton”

• “An excellent book for anyone who wants to understand service-orientation and the principles involved in designing services. A clear, concise and articulate exploration of the eight design principles involved in analyzing, designing, implementing, and maintaining services.”

• “Anish Karmarkar, Oracle Corporation”

• “Very well written, succinct, and easy to understand.”

• “Raj Balasubramanian, IBM

Software Group

“A comprehensive exploration of the issues of service design which has the potential to become the definitive work in this area.”

James Pasley, Chief Technology Officer, Cape Clear Software

“An excellent addition to any SOA library; it covers a wide range of issues in enough detail to be a valuable asset to anyone considering designing or using SOA based technologies.”

Mark Little, Director of Standards, Red Hat

“This book communicates complex concepts in a clear and concise manner. Examples and illustrations are used very effectively.”

Darryl Hogan, Senior Architect, Microsoft

“A work of genius”

Offers the most comprehensive and thorough explanation on the principles of service design and what it means to be “service oriented.”

Erl’s treatment of the complex world of service oriented architecture is pragmatic, inclusive of real world situations and offers readers ways to communicate these ideas through illustrations and well formulated processes.”

David Michalowicz, MITRE Corporation

“This is the book for the large organization trying to rationalize its IT assets and establish an agile platform for the future. By highlighting risk and rewards, Thomas Erl brings clarity to how Service Orientation can be applied to ensure a responsive IT organization. This book finally brings software engineering principles to address the real world development challenges being faced. To effectively serve the business, let alone embrace SOA, everyone involved should be familiar with the concepts investigated here. Thomas Erl thoroughly clarifies the nuances and defines the practice of service design. We expect that this will become a classic text in software engineering, corporate training and colleges.”

Cory Isaacson, President, Rogue Wave Software and Ravi Palepu, SOA Author and Speaker

“Thomas Erl does a great job”

an easy read.”

Michael H. Sor, Booz Allen Hamilton

“a must read for SOA Architects to develop a firm foundation and understanding of the principles (and trade-offs) that make up a good SOA service. After reading this book, it finally “clicked” as to why a properly designed SOA system is different (and better) than a system based on previous enterprise architectures.”

Fred Ingham, Platinum Solutions Inc.

“Lays a tremendous foundation for business and technical workers to come to common terms and expectations”

incredibly enlightening to see the details associated with achieving the SOA vision.”

Wayne P. Ariola, Vice President of Strategy, Parasoft

“[Erl does] and excellent job of addressing the breadth of [his] audience to present to those new to SOA and weaved in enough detail to assist those who are already actively involved in SOA development.”

R. Perry Smith, Application Program Manager, EDS/OnStar

“It is easy to miss the big picture of what SOA means for the design of larger scale systems amidst the details of WS technologies. Erl helps provide a broader perspective, surveying the landscape from a design standpoint.”

Jim Clune, Chief Architect, Parasoft

“Lays a firm foundation for the

underlying principles of good service design. Cuts through the hype and provides a cogent resource for improving architectural judgment on SOA projects.

• “Jim Murphy, Vice President of Product Management, Mindreef, Inc. “The first book to concisely, gradually and comprehensively explain how to apply SOA principles into enterprise-level software design. It is an excellent book.”

• “Robin G. Qiu, Ph.D., Division of Engineering and Information Science, Pennsylvania State University “I really think that this is a very useful book that a lot of people really need out there in the industry.”

• “Dr. Arnaud Simon, Principal Software Engineer, Red Hat “An indispensable companion to designing and implementing a service-oriented architecture. It condenses all information necessary to design services and is the most relevant source I know if in the field.”

• “[This book is] not only helpful, but fundamental to successfully designing an SOA.”

• “Phillipp Offermann, Research Analyst, University of Berlin “Service-Oriented Architecture is an important topic in IT today. Its vast scope could span an organization’s enterprise. Designing it properly is a major undertaking. This book provides timely, expert and comprehensive discussions on the principles of service design. Thomas has a keen sense in identifying the subtle points of various subjects and explains them in an easy-to-understand way. The book is a valuable resource for IT professionals working in SOA.”

• “Peter H. Chang, PhD, Associate Professor of Information Systems, Lawrence Technological University “The Definitive Guide to Service Engineering The key to succeeding with service-oriented architecture (SOA) is in comprehending the meaning and significance of its most fundamental building block: the service. It is through an understanding of service design that truly “service-oriented” solution logic can be created in support of achieving the strategic goals associated with SOA and service-oriented computing.

Bestselling SOA author Thomas Erl guides you through a comprehensive, insightful, and visually rich exploration of the service-orientation design paradigm, revealing exactly how services should and should not be designed for real-world SOA. This book’s in-depth coverage includes Over 240 full-color illustrations. A concise introduction to SOA and service-oriented computing concepts and benefits. A thorough exploration of the service-orientation design paradigm as represented by eight specific design principles. A comparison of service-oriented and object-oriented concepts and principles and a clear definition of what qualifies as “service-oriented” logic. Detailed coverage of four different forms of service-related design granularity. An exhaustive examination of service contracts, with an emphasis on standardization, abstraction, and the utilization of WS-Policy, XML Schema, and WSDL definitions. A comprehensive study of positive and negative service-related coupling types with an emphasis on the requirements to attaining a suitable level of loose coupling. An inside look into how commercial design approaches are incorporated to achieve truly agnostic

and reusable service logic. Techniques for maximizing service reliability, scalability, and performance by instilling high levels of autonomy and emphasizing stateless design. Approaches for positioning services as highly discoverable and interpretable enterprise resources. Unprecedented coverage of how to design services for participation in complex compositions. The definition of concrete links between each design principle and the strategic goals and benefits of SOA and service-oriented computing. Numerous cross-references to key design patterns documented separately in SOA: Design Patterns. [www.prenhallprofessional.com](http://www.prenhallprofessional.com) [www.soabooks.com](http://www.soabooks.com) [www.soasystems.com](http://www.soasystems.com) [Preface xxv](#) [Chapter 1: Introduction 1](#) [Chapter 2: Case Study Background 19](#) [Part I: Fundamentals](#) [Chapter 3: Service-Oriented Computing and SOA 25](#) [Chapter 4: Service-Orientation 67](#) [Chapter 5: Understanding Design Principles 103](#) [Part II: Design Principles](#) [Chapter 6: Service Contracts \(Standardization and Design\) 125](#) [Chapter 7: Service Coupling \(Intra-Service and Consumer Dependencies\) 163](#) [Chapter 8: Service Abstraction \(Information Hiding and Meta Abstraction Types\) 211](#) [Chapter 9: Service Reusability \(Commercial and Agnostic Design\) 253](#) [Chapter 10: Service Autonomy \(Processing Boundaries and Control\) 293](#) [Chapter 11: Service Statelessness \(State Management Deferral and Stateless Design\) 325](#) [Chapter 12: Service Discoverability \(Interpretability and Communication\) 361](#) [Chapter 13: Service Composability \(Composition Member Design and Complex Compositions\) 387](#) [Part III: Supplemental](#) [Chapter 14: Service-Orientation and Object-Orientation: A Comparison of Principles and Concepts 445](#) [Chapter 15: Supporting Practices 477](#) [Chapter 16: Mapping Service-Orientation Principles to Strategic Goals 497](#) [Appendices](#) [Appendix A: Case Study Conclusion 513](#) [Appendix B: Process Descriptions 517](#) [Appendix C: Principles and Patterns Cross-Reference 529](#) [Additional Resources 533](#) [About the Author 535](#) [About the Photos 537](#) [Index 539](#)

## Book Information

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## Customer Reviews

Where do I start? On the positive side. It is the only computer book I have read in years that is completely free of typing and grammatical errors. On the negative: Thomas Erls' previous book contains lots of valuable information about services. This book does not. A good design book would have contained more. Every time he starts to discuss something of depth, it is always beyond the scope of the book, contained in the companion Design Patterns book or in a book that he has yet to write, or he references another chapter containing a paragraph of clarification. The OOAD section is great, but that's not the topic of the book. You know those articles where the text is great, but the diagrams confusing and innane. Well in this book, the diagrams are inane and so is their description. Take for example, page 327. There is a drawing of a stationary car and a moving car. The text reads "State refers to the general condition of something. A car that is moving is in a state of motion, whereas a car that is not moving is in a stationary state." What enlightenment. Another figure, Figure 8.10 ( I know it well ), is repeated 4 times on two pages, and at various other places, with only changes to the text. I can't help but feeling, that if I read all of the following books that this one promotes, I may get one book's worth of content. I know that my review differs from the others. I have extensive experience in design ( although not SOA design ), and found most of what was discussed repetitive and obvious. Also I can't help but notice when I look at other reviewers' profiles, they have only ever reviewed one book, or at most two. I will probably buy, or at least checkout the SOA patterns book ( referenced extensively in this one as published, but lost in book desert ). I hope it contains the content that this book should have contained.

This book is beautifully produced. The printing is first rate, the multi-color format is very pleasing to the eye, it smells wonderful, and it is superbly copy-edited (I caught no typos or grammar atrocities as is typically par with technology books). The content you ask? Well that is a bit secondary I am afraid. While the copy-editing is first rate, the content editing is in need of some work. There is some really excellent content in this book but it is too often mired in beautiful but banal diagrams and structurally sound but superflourous text. It simultaneously suffers from both redundancy and paucity of information. The reader is too often referred to other books in the series, websites, or other sources of information. In the end I think that there is some great content here, but I am afraid

that many readers will give up in boredom or frustration before digesting all of the content.

This book is excellently produced in terms of presentation and content. That in itself is a hint that it is neither a fact book nor a how-to guide. It has no other intention than to sell the reader on the idea of SOA. Yes, it does describe the various technological concepts and principles but it does not contain a discussion of what it actually means to do SOA and what problems you will encounter in the real world. It is a lot of money for a piece of marketing. If you need to sell SOA to your C-level management then this is a good way to do it. If you want to know how to deliver on the promise of this book then you will find that there is not much out there. What is however happening is that the term SOA is being redefined and changed continuously so that in the end, the people who promoted it can turn around and say: 'See we did it after all!' I still think that we should focus on the business user and his needs and not on a piece of useless architecture. This is where in my mind this book fails. It does not help me to improve IT for the business users and therefore it does not help the business. More on my blog: [...]

"...but it stinks." (Oscar Wilde) This book, like others in the Thomas Erl SOA series, suffers from being long on words but short on actual content. Everything is presented in such an abstract and meta-level way as to be almost useless. I get the impression that the end goal of the methodology described in this book is to produce more documentation, rather than to produce actual, functioning services. Read a few hundred pages of this book, then step back and ask yourself, "What exactly have I learned that I couldn't tell someone in a couple pages?" In addition to all the wordiness and redundancy, almost every topic refers the reader to some other Thomas Erl book or website for more complete information. And of course, the delightful pointless diagrams... My real question (and I'm not being snide here) is, "Who \*is\* Thomas Erl?" What exactly are his credentials for presenting himself as the "guru of SOA?" The bio and testimonials on his website all present him as an expert precisely because he has written all these books. There's no other background about him. Where did his expertise come from? Has he ever actually worked in the industry? Or is he someone who recognized SOA as the next big software "thing" and was lucky enough to write the first book? In other words, like some of those personalities on "Hollywood Squares," is he famous simply because he's famous? I don't know; I'm asking. Certainly the fuzzy, "meta-" quality of information in his books (and I've slogged through two of them so far) doesn't give me the sense that I'm reading the clear, incisive thoughts of someone who's actually worked in (and mastered) a particular domain. People who really know what they're talking about can generally communicate an idea very succinctly. That



isn't the case with this book.

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