

Making Everything Easier!™

2nd Edition

Service Oriented Architecture

FOR
DUMMIES®

Learn to:

- Identify what SOA is and why it's important
- Understand the components of a service oriented architecture
- Understand the business and financial imperatives of SOA
- Implement SOA best practices

**Judith Hurwitz
Robin Bloor
Marcia Kaufman
Fern Halper**



Get More and Do More at Dummies.com®



Start with **FREE** Cheat Sheets

Cheat Sheets include

- Checklists
- Charts
- Common Instructions
- And Other Good Stuff!

To access the Cheat Sheet created specifically for this book, go to www.dummies.com/cheatsheet/serviceorientedarchitecture

Get Smart at Dummies.com

Dummies.com makes your life easier with 1,000s of answers on everything from removing wallpaper to using the latest version of Windows.

Check out our

- Videos
- Illustrated Articles
- Step-by-Step Instructions

Plus, each month you can win valuable prizes by entering our Dummies.com sweepstakes.*

Want a weekly dose of Dummies? Sign up for Newsletters on

- Digital Photography
- Microsoft Windows & Office
- Personal Finance & Investing
- Health & Wellness
- Computing, iPods & Cell Phones
- eBay
- Internet
- Food, Home & Garden

Find out "HOW" at Dummies.com

*Sweepstakes not currently available in all countries; visit Dummies.com for official rules.



Service Oriented Architecture

FOR

DUMMIES®

2ND EDITION

**by Judith Hurwitz, Robin Bloor,
Marcia Kaufman, and Fern Halper**



WILEY

Wiley Publishing, Inc.

Service Oriented Architecture For Dummies®, 2nd Edition

Published by
Wiley Publishing, Inc.
111 River Street
Hoboken, NJ 07030-5774

www.wiley.com

Copyright © 2009 by Wiley Publishing, Inc., Indianapolis, Indiana

Published by Wiley Publishing, Inc., Indianapolis, Indiana

Published simultaneously in Canada

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 646-8600. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, (201) 748-6011, fax (201) 748-6008, or online at <http://www.wiley.com/go/permissions>.

Trademarks: Wiley, the Wiley Publishing logo, For Dummies, the Dummies Man logo, A Reference for the Rest of Us!, The Dummies Way, Dummies Daily, The Fun and Easy Way, Dummies.com, Making Everything Easier, and related trade dress are trademarks or registered trademarks of John Wiley & Sons, Inc. and/or its affiliates in the United States and other countries, and may not be used without written permission. All other trademarks are the property of their respective owners. Wiley Publishing, Inc., is not associated with any product or vendor mentioned in this book.

LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: THE PUBLISHER AND THE AUTHOR MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES OR PROMOTIONAL MATERIALS. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR EVERY SITUATION. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING LEGAL, ACCOUNTING, OR OTHER PROFESSIONAL SERVICES. IF PROFESSIONAL ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT. NEITHER THE PUBLISHER NOR THE AUTHOR SHALL BE LIABLE FOR DAMAGES ARISING HEREFROM. THE FACT THAT AN ORGANIZATION OR WEBSITE IS REFERRED TO IN THIS WORK AS A CITATION AND/OR A POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE AUTHOR OR THE PUBLISHER ENDORSES THE INFORMATION THE ORGANIZATION OR WEBSITE MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. FURTHER, READERS SHOULD BE AWARE THAT INTERNET WEBSITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ.

For general information on our other products and services, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

For technical support, please visit www.wiley.com/techsupport.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Library of Congress Control Number: Library of Congress Control Number is available from the publisher.

ISBN: 978-0-470-37684-3

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1



About the Authors

Judith Hurwitz is a technology strategist and thought leader. She is the president of Hurwitz & Associates, a business technology strategy firm that helps companies gain business benefit from their technology investments. In 1992, she founded the Hurwitz Group, a technology research group. She has worked in various corporations, such as John Hancock, Apollo Computer, and Patricia Seybold's Group. She has written numerous articles and white papers, and publishes a regular blog. Judith holds a BS and MS degrees from Boston University.

Judith provides strategic guidance to both vendors and customers of distributed technologies. Judith is a frequent keynote speaker at industry events. She was named a distinguished alumnus Boston University's College of Arts & Sciences in 2005. She is also a recipient of the 2005 Massachusetts Technology Leadership Council award.

Robin Bloor, a Partner with Hurwitz & Associates, has been an IT consultant and technology analyst for almost 20 years. He lived and worked in the UK until 2002, founding the IT analysis company, Bloor Research, which published comparative technology reports that covered everything from computer hardware architectures to ecommerce. Prior to co-authoring this book, he was already a published author, having written the UK business best seller, *The Electronic Bazaar: From the Silk Road to the E-Road* (published by Nicholas Brealey Publishing), which analyzed and explained the field of ecommerce.

In 2002, Robin moved to the US and now resides in Austin, Texas. In 2005, he merged his US analyst company with Hurwitz and Associates and in 2006, he began to take an interest in the expanding area of SOA. Robin has become an influential and respected commentator on many corporate IT issues and is in great demand as a presenter at conferences, user groups, and seminars.

Marcia Kaufman, a founding Partner and chief operating officer of Hurwitz & Associates, has 20 years of experience in business strategy, industry research, service oriented architectures, software quality, information services, and analytics. In addition to publishing a regular technology blog, Marcia has written extensively on SOA, information management, and the business value of information technology. Marcia has worked on financial services industry modeling and forecasting in various research environments including Data Resources Inc. (DRI). She holds an AB from Connecticut College in mathematics and economics and an MBA from Boston University.

Dr. Fern Halper, a Partner at Hurwitz & Associates, has over 20 years of experience in data analysis, business analysis, and strategy development. Fern has published numerous articles on data mining and information technology. She has done extensive research, writing, and speaking on the topic of text analytics. She publishes a regular technology blog. Fern has held key positions at AT&T and Lucent Technologies. Fern spent eight years at Bell Laboratories leading the development of innovative approaches and systems to analyze marketing and operational data. She has also taught at both Colgate University and Bentley College. Fern received her BA from Colgate University and her PhD from Texas A&M University.

Dedication

Judith dedicates her part of the book to her family — her husband, Warren; her children, Sara and David; and her mother, Elaine. She also dedicates this book in memory of her father, David.

Robin dedicates his part of the book to Judy, for her encouragement, support, and advice.

Marcia dedicates her part of the book to her husband, Matthew; her daughters, Sara and Emily; and her parents, Larry and Gloria.

Fern dedicates her part of the book to her husband, Clay; and her daughters, Katie and Lindsay. She also dedicates this book in memory of her parents, Stanley and Phyllis.

Author's Acknowledgments

We heartily thank our friends at Wiley, most especially Jean Nelson and Katie Feltman. Thank you to our development editor, Linda Morris. Our colleague at Hurwitz & Associates, Carol Caliendo, deserves our heartfelt thanks.

We learned a tremendous amount from all our interactions with IT executives who willingly and graciously shared their experience and knowledge about their SOA journey. We would like to acknowledge the following individuals:

AstraZeneca's Mark Stocksdale; Austin Energy's Andres Carvallo; Avnet's Sean Valcamp; Bell Aliant's Tony Lodge; The Carphone Warehouse's Pawel Maszyk and David Byrne; Cadtel Systems' Bryan Rank; Cigna's Brian Mitchell, Chad Roberts, and Tim Fitzgerald; Cisco's Chris Wiborg, Paul Liesenberg, Guillermo Diaz Jr., Craig Hinkley, and David M. Gagliano; Delaware Electric's Gary Cripps; U.S. Defense Intelligence Agency's Steve Willet and Sean Kelly; Gaylord Entertainment's Bill Glasgow; Hampshire County Council's Jos Creese and former consultant Andy Holdup; Intercontinental Hotel Group's Eric Norman and Bill Peer; Independence Blue Cross's Thomas Cangelosi; Innoveo Solutions' Nick Stefania and Didier Beck; Jack Henry & Associates' Kevin Sligar and Debbie Wood; Partners HealthCare Systems' Steve Flammini and Mary Finlay; RLP Technologies' Norman Marks and Joe LaFeir; Redlasso's Mark Thompson and Liquid Hub's Tim Regovich; U.S. Department of Defense's David Howard and CommIT Enterprises' Cameron Hunt; Spotlight Pty Ltd's Anne McDiarmid and KAZ-Group's Victoria Redwood; State Street's Jason Weisser, Debra Ciccerone, and David Saul; Telenor's Magnus Bakken and Juan Carlos Lopez Calvet; The Hartford's Ben Moreland; Thomson Reuters' Vladimir Mitevski; and Virgin Entertainment Group's Robert Fort.

Thank you to our friends representing many of the vendors, systems integrators, and industry associations in the SOA community:

IBM's Debbie Cassie, Andy Warzecha, Paulson Lan, Janell Straach, Wayne Perry, Beverly Lowry, Virginia Agee, Valerie Jackson, Andrew Manby, Nicole Fortenberry, Mark-Thomas Schmidt, Greg Fleurry, Debbie Langenfeld, Patty Rowell, Sandy Berman, Fil Bowen, Doug Brown, Ambuj Goyal, Sandy Carter, John Simonds, Glenn Hintze, Sarita Torres, Sara Peck, Steve Mills, Robert LeBlanc, Michael Curry, Martha Leversuch; HP's Tim Hall, David Gee, David Butler, Jean Kondo, Tom Hogan, Ann Livermore, Tiffany Tuel, and Ruth Busbee; Liquid Hub's Tom Cozzolino; Progress Software's Trip Kucera; Red Hat's Pierre Frick and Sean White; Software AG's Franco Castaldini; The SOA Consortium's Richard Soley and Brenda Michelson; Thetus' Philip Pridmore-Brown; Novell's Ian Bruce; CA's Al Nugent; Clarabridge's Vanessa Stirling; LSH Communications' Kathy Tebben; Pan Communications' Erica Burns; and Waggener Edstrom Worldwide's Lyn Oliver.

Publisher's Acknowledgments

We're proud of this book; please send us your comments through our online registration form located at <http://dummies.custhelp.com>. For other comments, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

Some of the people who helped bring this book to market include the following:

Acquisitions and Editorial

Project Editors: Jean Nelson and Linda Morris

Senior Acquisitions Editor: Katie Feltman

Senior Copy Editor: Teresa Artman

Technical Editor: Susan Eustice

Editorial Manager: Kevin Kirschner

Media Development Project Manager: Laura Moss-Hollister

Media Development Assistant Project Manager: Jenny Swisher

Media Development Assistant Producers:
Angela Denny, Josh Frank, Shawn Patrick,
and Kit Malone

Editorial Assistant: Amanda Foxworth

Sr. Editorial Assistant: Cherie Case

Cartoons: Rich Tennant
(www.the5thwave.com)

Composition Services

Project Coordinator: Patrick Redmond

Layout and Graphics: Samantha Allen,
Melissa K. Jester, Sarah Phillipart

Proofreaders: John Greenough, Toni Settel,

Indexer: Broccoli Information Management

Special Help: Heidi Unger

Publishing and Editorial for Technology Dummies

Richard Swadley, Vice President and Executive Group Publisher

Andy Cummings, Vice President and Publisher

Mary Bednarek, Executive Acquisitions Director

Mary C. Corder, Editorial Director

Publishing for Consumer Dummies

Diane Graves Steele, Vice President and Publisher

Composition Services

Gerry Fahey, Vice President of Production Services

Debbie Stailey, Director of Composition Services

Contents at a Glance

| | |
|--|------------|
| <i>Introduction</i> | 1 |
| <i>Part I: Getting Started with SOA</i> | 5 |
| Chapter 1: Getting to Know SOA..... | 7 |
| Chapter 2: Are You Ready for SOA? A Self Test..... | 17 |
| Chapter 3: Making Sure SOA Happens | 25 |
| Chapter 4: SOA Quick Start: Entry Points for Starting the SOA Journey..... | 35 |
| <i>Part II: Introducing SOA Basics</i> | 41 |
| Chapter 5: Understanding Software Architecture | 43 |
| Chapter 6: Working with Software Components..... | 57 |
| Chapter 7: Discovering the Main Components of SOA | 71 |
| Chapter 8: Playing Fast and Loose: Loose Coupling and Federation | 87 |
| Chapter 9: The Collaborative Lifecycle of the Business Process | 99 |
| <i>Part III: Nitty-Gritty SOA</i> | 113 |
| Chapter 10: (e)Xplaining XML..... | 115 |
| Chapter 11: Dealing with Adapters..... | 129 |
| Chapter 12: Discovering the Service Broker | 139 |
| Chapter 13: The Enterprise Service Bus | 147 |
| Chapter 14: The SOA Service Manager | 161 |
| <i>Part IV: SOA Sustenance</i> | 173 |
| Chapter 15: SOA Governance | 175 |
| Chapter 16: SOA Security..... | 185 |
| Chapter 17: Turning Data into Services | 197 |
| Chapter 18: SOA Software Development..... | 211 |
| Chapter 19: The Registry and the Repository..... | 229 |
| Chapter 20: Putting Quality into SOA..... | 243 |

| | |
|--|------------|
| <i>Part V: Real Life with SOA</i> | 251 |
| Chapter 21: Financial Services | 253 |
| Chapter 22: Government | 267 |
| Chapter 23: Healthcare | 279 |
| Chapter 24: Hospitality and Travel | 291 |
| Chapter 25: Information Services | 299 |
| Chapter 26: Manufacturing and Distribution | 313 |
| Chapter 27: Retail..... | 319 |
| Chapter 28: Telecommunications | 331 |
| Chapter 29: Utilities and Energy | 341 |
| <i>Part VI: The Part of Tens</i> | 351 |
| Chapter 30: Ten Swell SOA Resources | 353 |
| Chapter 31: Ten SOA No-Nos..... | 357 |
| <i>Glossary</i> | 361 |
| <i>Index</i> | 373 |

Table of Contents

| | |
|---|-----------|
| <i>Introduction</i> | 1 |
| About This Book | 1 |
| Foolish Assumptions | 2 |
| How This Book Is Organized | 2 |
| Part I: Getting Started with SOA | 2 |
| Part II: Introducing SOA Basics | 3 |
| Part III: Nitty-Gritty SOA | 3 |
| Part IV: SOA Sustenance | 3 |
| Part V: Real Life with SOA | 3 |
| Part VI: The Part of Tens | 3 |
| Icons Used in This Book | 4 |
| Where to Go from Here | 4 |
| | |
| <i>Part I: Getting Started with SOA</i> | 5 |
| | |
| Chapter 1: Getting to Know SOA | 7 |
| Business Lib | 8 |
| Tech Lib | 9 |
| A SOA Case Study | 9 |
| Better Living through Reuse | 11 |
| Moving in Tandem with SOA | 13 |
| Sweeping Unightly Technology under the Rug | 14 |
| Understanding Why SOA Is Different | 14 |
| | |
| Chapter 2: Are You Ready for SOA? A Self Test | 17 |
| Question 1: Is Your Business Ecosystem Broad and Complex? | 18 |
| Question 2: Is Your Industry Changing Quickly? | 19 |
| Question 3: Do You Have Hidden Gems inside Your Software Applications? | 19 |
| Question 4: Are Your Software Systems Flexible? | 20 |
| Question 5: How Well Prepared Is Your Organization to Embrace Change? | 20 |
| Question 6: How Dependable Are the Services Provided by IT? | 21 |
| Question 7: Can Your Company's Technology Support Corporate and IT Governance Standards? | 21 |
| Question 8: Do You Know Where Your Business Rules Are? | 22 |
| Question 9: Is Your Corporate Data Flexible, and Do You Trust Its Quality? | 23 |
| Question 10: Can You Connect Your Software Assets to Entities outside the Organization? | 23 |
| What's Your Score? | 24 |



Chapter 3: Making Sure SOA Happens. 25

- Overcoming Fears about SOA..... 26
- Assuring a Better Quality of Service 27
- Complying with Government Regulation..... 28
- Educating Rita and Peter and Raul and Ginger..... 28
- Choosing a Test Case Carefully 29
- Revolutionizing IT to Work with SOA..... 30
- Fostering Creativity, but with a Caveat 31
- Banishing Blame and Working Together 32
- Documenting and Marketing Your Successes..... 33
- Planning for Success 33

**Chapter 4: SOA Quick Start: Entry Points
for Starting the SOA Journey 35**

- Mapping Your Organization’s Business Structure 36
- Picking Your Initial SOA Targets to Gain Experience
and Demonstrate Success..... 37
- Preparing Your Organization for SOA..... 38
 - IT developers need a different approach 38
 - Business managers need to look beyond
their own departments..... 39
- Finding Out Why Business Partners Are Part
of the SOA Success Story 39
- Getting Help with SOA..... 40
- Setting Off to the Races..... 40

Part II: Introducing SOA Basics..... 41

Chapter 5: Understanding Software Architecture 43

- Defining a Service Oriented Architecture..... 44
- Defining an Architecture..... 45
 - Basic architecture..... 46
 - Basic service..... 47
 - Business services..... 47
 - Elementary service oriented architecture..... 48
- Understanding Four Problems That Complicate SOA 49
 - Complication #1: You have to keep the business logic
and plumbing separate..... 50
 - Complication #2: You don’t start from scratch 52
 - Complication #3: Application logic creeps in to
the business layer 53
 - Complication #4: Coordinating the components can be tricky 54
- Why SOA? Better Business and Better IT 56

| | |
|---|-----------|
| Chapter 6: Working with Software Components | 57 |
| Components and Component Wannabes | 57 |
| Understanding software components | 58 |
| Making sure your components play nicely together..... | 59 |
| Building in reusability | 60 |
| Web Services: The Early Days..... | 61 |
| When Web Services Grow Up..... | 64 |
| Defining Business Processes | 65 |
| Understanding a business process example | 66 |
| Seeing how business processes are like production lines | 67 |
| Creating New Applications from Old: Composite Applications | 67 |
| Moving toward end-to-end process..... | 68 |
| Adopting business processes and composite applications | 70 |
| | |
| Chapter 7: Discovering the Main Components of SOA | 71 |
| Making SOA Happen | 71 |
| Catching the Enterprise Service Bus..... | 72 |
| Welcome to the SOA Registry and Repository | 73 |
| Orchestrating End-to-End Services | 75 |
| Introducing the business process orchestration manager | 75 |
| Your friendly neighborhood service broker | 76 |
| The SOA service manager, again | 76 |
| Managing Business Process under SOA | 77 |
| BPM terminology | 79 |
| BPM tools..... | 79 |
| Application failures: Let us count the ways | 82 |
| Measuring service levels..... | 83 |
| End-to-end service | 84 |
| Taking just one more look at the Process Manager | 85 |
| | |
| Chapter 8: Playing Fast and Loose: Loose Coupling and Federation | 87 |
| Understanding Software Dependencies..... | 88 |
| Loose Coupling | 89 |
| Seeing Software as a Service | 91 |
| Licensing models and service | 92 |
| Software as a service and SOA..... | 93 |
| Implementing a Federated Software Structure | 94 |
| SOA and federation..... | 95 |
| Federated identity management | 97 |
| Federated information management | 97 |
| Discovering the Industrialization of Software..... | 97 |

Chapter 9: The Collaborative Lifecycle of the Business Process99

| | |
|---|-----|
| Fitting Enterprise Architecture with SOA..... | 100 |
| Managing Business Processes | 101 |
| A language called BPEL..... | 101 |
| Managing business processes: | |
| Orchestration and monitoring..... | 102 |
| The Dawn of Unified Communications | 103 |
| Figuring out why communications need unifying..... | 104 |
| Discovering the benefits of unified communications..... | 105 |
| Simple presence versus complex presence | 105 |
| Communications Enabled Business Processing..... | 107 |
| Making Unified Communications Dynamic | 109 |
| Web 2.0 and social networks..... | 110 |
| Web 2.0 and SOA: You complete me | 112 |

Part III: Nitty-Gritty SOA..... 113**Chapter 10: (e)Xplaining XML.....115**

| | |
|--|-----|
| My Computer Is a Lousy Linguist..... | 116 |
| So what is XML exactly?..... | 117 |
| XML's extensibility | 118 |
| How does XML work? | 119 |
| Discovering other technologies that work with XML..... | 120 |
| A Little Bit of SOAP (And WSDL) | 123 |
| Name spaces..... | 124 |
| SOAP comes in envelopes..... | 124 |
| REST..... | 125 |
| WSDL | 126 |

Chapter 11: Dealing with Adapters129

| | |
|--|-----|
| Making Connections | 130 |
| In a Bind: When Software Components Get Together | 132 |
| Getting to Know Your Adapter Options | 133 |
| Building an Adapter..... | 135 |

Chapter 12: Discovering the Service Broker.....139

| | |
|--|-----|
| Defining the Central Role of the Service Broker | 140 |
| Sitting Between Consumers and Providers | 140 |
| Seeing the Registry and Repository as the Broker's Partners..... | 141 |
| Calling on the SOA registry..... | 141 |
| Collecting information for the repository..... | 142 |
| Brokering a Deal | 143 |
| Understanding the Service Broker's Responsibilities | 144 |

| | |
|---|------------|
| Chapter 13: The Enterprise Service Bus | 147 |
| Discovering ESB Basics..... | 148 |
| Finding Out What's inside the Bus | 151 |
| ESB Services: Of Messages, Management, and Security..... | 153 |
| Messaging services..... | 153 |
| Management services..... | 155 |
| Interface services..... | 156 |
| Mediation services..... | 157 |
| Metadata services..... | 157 |
| Security services..... | 158 |
| Running the Enterprise Service Bus..... | 159 |
| No ESB is an island | 159 |
| The ESB keeps things loose..... | 160 |
| The ESB delivers predictability..... | 160 |
| | |
| Chapter 14: The SOA Service Manager | 161 |
| Getting to Know the Plumbing..... | 162 |
| Cutting the IT layer cake..... | 163 |
| Looking at the plumbing service..... | 164 |
| Grasping the Role of the SOA Service Manager | 168 |
| SOA service management: The inside view..... | 169 |
| Getting real | 170 |
| | |
| Part IV: SOA Sustenance | 173 |
| | |
| Chapter 15: SOA Governance | 175 |
| Understanding SOA Governance | 175 |
| Governing IT..... | 177 |
| Figuring out the SOA wrinkle in IT governance | 177 |
| Collaborating to Meet Business Goals Gained from Business Services | 178 |
| | |
| Chapter 16: SOA Security | 185 |
| Seeing How the User Fits in the Security Equation | 186 |
| Deciding What the User Can Do..... | 187 |
| Identity management software..... | 188 |
| Why identity management software works | 190 |
| Authenticating Software and Data..... | 191 |
| Software fingerprints..... | 192 |
| Digital certificates | 193 |
| Auditing and the Enterprise Service Bus..... | 195 |

| | |
|--|------------|
| Chapter 17: Turning Data into Services | 197 |
| When Good Data Goes Bad: Getting Clean and Consistent Data..... | 197 |
| Discovering Dastardly Data Silos: An Example..... | 200 |
| Trust Me: Integrating Data Sources..... | 202 |
| Data profiling..... | 203 |
| Data quality..... | 203 |
| Data transformation | 204 |
| Data governance and auditing | 204 |
| Providing Information as a Service | 205 |
| Data control..... | 205 |
| Consistent data definitions | 206 |
| Ensuring quality of data..... | 208 |
| Data services | 209 |
| Data independence..... | 210 |
| Chapter 18: SOA Software Development | 211 |
| Building a Business Process Map..... | 212 |
| Exploring New SOA-Specific Software Development Tools..... | 214 |
| Defining the Software Development Life Cycle..... | 215 |
| BPM tools and software development | 217 |
| Mapping the business process..... | 218 |
| Combining SOA and the Rich Interfaces..... | 220 |
| The rich interface | 221 |
| Cloud computing..... | 222 |
| Discovering Mashups..... | 223 |
| Creating Software Ecosystems..... | 224 |
| Taming Mashups, Plugins, and Downloads..... | 226 |
| Chapter 19: The Registry and the Repository | 229 |
| Enabling the Reuse of Business Services | 229 |
| Combining Governance and Reuse | 231 |
| Understanding the Registry and the Repository..... | 231 |
| Introducing the Service Broker..... | 232 |
| “Signing” the Registry | 233 |
| All about the repository..... | 234 |
| Reuse of business services and SLAs..... | 236 |
| Working Together: Governance, the Repository, and the Registry | 237 |
| The repository and internal publishing..... | 239 |
| The registry and real-time governance..... | 240 |
| The registry and external publishing | 240 |
| Chapter 20: Putting Quality into SOA | 243 |
| Grasping the Unexpected Challenges of SOA | 244 |
| Remembering the Good Old Days of Software Quality..... | 245 |
| Unit testing of Web Services..... | 247 |
| Integration testing..... | 247 |
| Stress testing and performance testing..... | 248 |

Understanding Why SOA Quality Is Beyond Testing 248
 The nature of SOA complicates testing..... 248
 Virtual SOA testing 249

Part V: Real Life with SOA..... 251

Chapter 21: Financial Services 253

CIGNA 254
 Business and IT collaboration..... 255
 Why this approach works..... 257
 Innoveo Solutions 257
 Innoveo is born 258
 Innoveo’s approach..... 258
 Next steps 261
 Jack Henry & Associates..... 261
 The business problem..... 262
 The SOA solution 262
 Expanding opportunities for growth with SOA..... 263
 Creating business services 264
 Reaping the benefits of SOA..... 265

Chapter 22: Government 267

The Defense Intelligence Agency..... 268
 PKI meets data composites 269
 The next frontier: Collaboration 271
 Hampshire County Council 272
 SOA and information sharing 272
 Eliminating boundaries 273
 CommIT Enterprises 274
 Applying semantics in a service oriented architecture 275
 The impact of semantic models on building a SOA..... 276
 The importance of context 277
 SOA and 'Net-centric warfare 278

Chapter 23: Healthcare 279

AstraZeneca..... 280
 AstraZeneca and SOA..... 280
 Organizational backing for SOA..... 281
 Going forward..... 282
 Independence Blue Cross 283
 Strategic SOA..... 283
 Step 1: Governing SOA..... 284
 Step 2: Application developers take a leap of faith 285
 What’s next for IBC? 286
 Lessons learned 286

| | |
|---|------------|
| Partners HealthCare | 287 |
| Decoupling the data from the application | 287 |
| Working with Partners | 288 |
| High Performance Medicine | 289 |
| Chapter 24: Hospitality and Travel | 291 |
| Gaylord Hotels | 292 |
| Standardization of the Property Management System | 293 |
| A new look at third-party hosted applications | 294 |
| What's next for Gaylord hotels | 294 |
| InterContinental Hotels Group..... | 295 |
| Distributing key channel information | 295 |
| SOA implementation highlights | 296 |
| IHG's SOA reference architecture: A self-healing ecosystem..... | 297 |
| Lessons learned in IHG's journey to SOA | 298 |
| Chapter 25: Information Services | 299 |
| R.L. Polk & Co..... | 299 |
| The business challenge..... | 300 |
| The IT challenge..... | 301 |
| Decoding a vehicle..... | 302 |
| Data as a service | 303 |
| Lessons learned after four years of SOA..... | 304 |
| Redlasso..... | 306 |
| How does Redlasso do it? | 306 |
| SOA, speed, and scale | 307 |
| Moving forward..... | 307 |
| Thomson Reuters | 308 |
| Finding a solution to improve agility and time to market | 309 |
| Business units gain control of business services with SOA..... | 310 |
| Working with the registry | 311 |
| A repository is added to the mix | 312 |
| The benefit of SOA | 312 |
| Chapter 26: Manufacturing and Distribution..... | 313 |
| Avnet | 314 |
| The gateway..... | 314 |
| Questions to think about before embarking on SOA..... | 315 |
| Cisco..... | 316 |
| Transforming to SOA..... | 317 |
| Changing the nature of partnerships with SOA | 318 |
| Chapter 27: Retail | 319 |
| Spotlight Pty Ltd..... | 320 |
| Step 1: The point-of-sale system | 321 |
| Step 2: The ERP system and beyond | 322 |

Choosing the right technology..... 322
 Best practices for fast tracking SOA..... 323
 The Carphone Warehouse PLC..... 324
 Dealing with growth..... 324
 Build or buy..... 325
 Selecting reusable components 326
 Dealing with organizational issues 326
 Going forward..... 327
 Virgin Entertainment Group..... 328
 Turning data into services..... 329
 Lessons learned 329

Chapter 28: Telecommunications 331

Bell Aliant 332
 SOA and system interfaces 332
 Selling the approach using ROI..... 333
 What’s next? 334
 Telenor Iris 334
 The enterprise service bus 335
 Scaling the service 336
 What’s next? 337
 Cadtel Systems..... 337
 Part 1: A business process SOA approach 338
 Part 2: How SOA helps to close the deal..... 339

Chapter 29: Utilities and Energy 341

Austin Energy 341
 Picking the low-hanging fruit..... 342
 Checking out SOA behind the scenes..... 344
 Delaware Electric..... 345
 Looking to IT to solve business problems..... 345
 Getting some SOA help..... 346
 Realizing the importance of business process 347

Part VI: The Part of Tens..... 351

Chapter 30: Ten Swell SOA Resources 353

Hurwitz & Associates 353
 SOA Consortium 353
 Finding OASIS 354
 The Eclipse Foundation 354
 SOA Modeling..... 355
 The SOA Institute..... 355
 Check Out the Vendors’ Sites 355
 Some Cool SOA Blogs..... 355
 Industry Groups Are Great Information Resources 356
 Enterprise Architecture and Business Process Resources..... 356

| | |
|--|----------------|
| Chapter 31: Ten SOA No-Nos | 357 |
| Don't Boil the Ocean | 357 |
| Don't Confuse SOA with an IT Initiative..... | 357 |
| Don't Go It Alone..... | 358 |
| Don't Think You're Too Special..... | 358 |
| Don't Neglect Governance..... | 358 |
| Don't Forget about Business Process | 358 |
| Don't Forget about Security | 359 |
| Don't Apply SOA to Everything..... | 359 |
| Don't Start from Scratch | 359 |
| Don't Postpone SOA..... | 359 |
| Glossary | 361 |
| Index | 373 |

Introduction

.....

Welcome to *Service Oriented Architecture For Dummies*, 2nd Edition. We are very excited that service oriented architecture (SOA) is starting to mature and move into the mainstream. Increasingly, we see SOA becoming not just a technology platform but a business platform. SOA is game changing, and SOA successes make it clear that SOA is here to stay. We hope this book is enough to ground you in SOA basics and to whet your appetite for the SOA adventure. We are also pleased that we can share more than 20 examples of how companies across nine vertical markets have used SOA as a way to improve business agility.

Service oriented architecture is more than a bunch of new software products strung together to allow technology companies to have something else to sell. SOA represents a dramatic change in the relationship between business and IT. SOA makes technology a true business enabler and empowers business and technology leaders alike.

The software industry has been on a journey toward a service oriented approach to software for more than 20 years. Smart people have known for a long time that if software can be created in such a way that it can be reused, life will be a lot better. If software can be designed to reflect how business operates, business and technology can align themselves for success. Finding good ways to reuse the years of investment in software means money spent wisely. These issues are at the heart of SOA and are among the reasons we think this book is so important.

SOA isn't a quick fix: It's a journey — and a very rewarding adventure. It's an approach built on industry standards, with large doses of forethought and planning. It is indeed a journey. We hope this book inspires you and helps you get started.

About This Book

Service oriented architecture is a big new area and requires that a lot of people familiarize themselves with it in a relatively short period of time. That's why we wrote this book. Some people may want to get deeper into the technological details, while others may care only about the business implications.

We recommend that you read the chapters in Part II, regardless of how deeply or shallowly you want to wander into the SOA pool. The information therein will help ground you in basic SOA concepts and prepare you for intelligent

conversations about the subject. We also recommend that everyone read the case studies in Part V, because seeing how real people put SOA to work is probably the best way to get a handle on what's in it for you.

You can certainly read this book from cover to cover (if you're that kind of person), but in true *For Dummies* style, chapters are self contained, so you can go straight to the topics that interest you most. Wherever you start, we wish you well.

Foolish Assumptions

Try as we might to be all things to all people, when it came to writing this book, we had to pick who we thought would be most interested in *Service Oriented Architectures For Dummies*, 2nd Edition. Here's who we think you are:

- ✔ **You're smart.** You're no dummy, yet the topic of service oriented architecture gives you an uneasy feeling. You can't quite get your head around it, and if pressed for a definition, you might try to change the subject.
- ✔ **You're a businessperson who wants little or nothing to do with technology,** but you live in the 21st century and find that you can't escape it. Everybody around is saying "SOA this" and "SOA that," so you think you better find out what they're talking about.
- ✔ **Alternatively, you're an IT person who knows a heck of a lot about technology,** but this SOA stuff is new, and everybody says it's something different. Once and for all, you want the whole picture.

Whoever you are, welcome. We're here to help.

How This Book Is Organized

We divide our book into six parts for easy consumption of SOA topics. Feel free to skip about.

Part I: Getting Started with SOA

In this part, we introduce you to the basic concepts of SOA, and then give you some pointers on how to get started. This part also includes a test you can use to help determine if you're ready for SOA.

Part II: Introducing SOA Basics

In this part, we introduce you to the major concepts and components so that you can hold your own in any meaningful conversation about SOA.

Part III: Nitty-Gritty SOA

Some folks are more technically oriented than others. In this part, we dive deeper into the actual SOA architecture components. The material in these chapters is groundbreaking. We've done the research and put into print concepts that the software industry has been struggling to articulate for the past few years. At this point, you won't find this material anywhere else in print.

Part IV: SOA Sustenance

Creating a SOA is one thing. Keeping it up and running, growing, adapting, and supporting business requires a lot more. This part delves into areas critical to SOA's longevity.

Part V: Real Life with SOA

SOA is real. Real businesses are using it today to great advantage. This part shares stories that come to us from 24 companies actively helping organizations put SOA into practice. These companies represent nine different vertical markets. We interviewed people from each of the projects we describe. You can take their word for it. SOA rules!

Part VI: The Part of Tens

If you're new to the *For Dummies* treasure trove, you're no doubt unfamiliar with The Part of Tens. In this part, Wiley editors torture *For Dummies* authors into creating useful bits of information easily accessible in lists containing ten (more or less) elucidating elements. We started these chapters kicking and screaming but are ultimately very glad they're here. We think you'll be, too.

After The Part of Tens chapters, we provide a glossary. We try diligently to define terms as we go along, but we think having a handy-dandy reference is very useful.

Icons Used in This Book

Like all *For Dummies* books, this book makes use of icons in the margin. These icons help draw attention to paragraphs that we think you need to pay attention to, or in some cases, paragraphs that you can skip over.



We use this icon to highlight a paragraph that contains a particularly useful point that you'll be wise to pay attention to.



Watch out and pay attention when you see this icon. The bother you save may be your own.



This icon points out a reminder or a point you'll want to stow away in your long-term memory. You may be sorry if this little tidbit slips your mind.



When we get into details that are highly technical or even geeky, we let you know with this icon. We hope these tidbits will augment the understanding for the more technically inclined. Those with sensitive stomachs can gleefully ignore these icons.

Where to Go from Here

We created an overview of SOA and introduce you to all its significant components. Many chapters here could be expanded into full-length books of their own. SOA and the entire distributed technology landscape is a big focus for us at Hurwitz & Associates, and we invite you to visit our site and read our blogs and insights at www.hurwitz.com.

Part I

Getting Started with SOA

The 5th Wave

By Rich Tennant



"That reminds me - I have to sort out the business services on the corporate network."

In this part . . .

Starting a SOA journey might seem daunting. But, as the sages say, “A journey of a thousand miles begins with a single step.” In this part, we help you take that first step by showing you some great places to start your SOA journey and some great ways to do it.

Chapter 1

Getting to Know SOA

In This Chapter

- ▶ Finding out why you should care about SOA
 - ▶ Liberating business from the constraints (and tyranny) of technology
 - ▶ Illustrating the need for SOA
 - ▶ Saving bundles by using what you have
 - ▶ Expanding your SOA to customers, partners, and suppliers
 - ▶ Focusing on function
-

Service oriented architecture (SOA) is a hot topic being bandied about by IT vendors across the globe. IBM, Hewlett-Packard, Software AG, Oracle, SAP, and Microsoft (just to drop a few names) are all singing from the SOA songbook, and hundreds of vendors are adding their tunes as we speak.

“What’s SOA?” you ask. We suspect that you’ve already skimmed a dozen articles and read (or deleted) hundreds of e-mails from vendors pushing SOA, but the answers you’ve gotten so far have been, well, vague and inadequate.

The short answer is that SOA is a business approach to building IT systems that allows businesses to

- ✓ Leverage existing assets
- ✓ Create new ones
- ✓ Easily enable the inevitable changes required to support the business

For you impatient readers out there, we expand on this short answer in Chapter 5. However, right now, we think the more important question is, “Why should I care about SOA?” In this chapter, we try to answer this question.

The promise of service oriented architecture is to liberate business from the constraints of technology, unshackling technologists and business leaders from the chains they themselves have forged. (“IT workers of the world, unite! You have nothing to lose but your chains!” as it were.) This has major implications both for the business and for the IT structure that supports the business.

From our perspective, one of the most important aspects of SOA is that it’s a *business* approach and methodology as much as it is a *technological* approach and methodology. SOA enables businesses to make business decisions *supported* by technology instead of making business decisions *determined* by or *constrained* by technology. And with SOA, the folks in IT finally get to say “yes” more often than they say “no.”



We pronounce *SOA* to rhyme with *boa* (***bow-uh***). Stretching it out by clearly articulating each letter (S-O-A) is perfectly acceptable but might leave you stymied when we say things like, “SOA what?”

Business Lib

Executives have come to rely on technology — in terms of reporting, text analytics, projections, graphical representations, risk analysis, and other analytical tools — to make informed decisions for their company. The day-to-day operations of a company have slipped, little by little, into the hands of IT. Quite simply, more and more of the activities of an organization are supported by increasing levels of business process automation — whether its business is to build ships, sell insurance, or manage cities — and since IT implements the automation of business process, business decision makers have become more dependent upon IT. While this increasing use of technology has helped the business in so many ways, technology has also created significant constraints. At many companies, business and IT management operate in very separate worlds without the benefit of a common unifying language. Unfortunately, as organizations become more diverse and complex through mergers, acquisitions, globalization, and the need to manage lots more data, the supporting IT infrastructure has become more cumbersome and brittle after being stretched in so many different ways to keep up with all the changes. This is not good for business, and neither is it good for IT.

We’re not advocating that business leaders should (or can) take control of the technology from the hands of IT. Modern businesses are inextricably tied to technology. No sizable business can function without IT — it’s as simple as that. However, we are advocating a new world order. Indeed, we advocate that business leaders and IT work together to create this new world order. *Together*, business leaders and IT will communicate how the automated processes of its business should be facilitated, and work together to make it a

reality by using SOA. *Together*, IT and business leaders can determine a strategy that both liberates business from IT and allows IT to create maintainable, extensible, compliant systems to support the initiatives determined by business leaders.

Tech Lib

Just because business has become constrained by technology, don't think that the folks in IT are having a jolly old time basking in their new-found power. On the contrary, the IT staff gets to spend its time in endless meetings accounting for why projects are late, explaining why applications can't easily be adapted to changing business conditions, and pleading for more staff. When some clever marketer presents a new concept for selling more widgets via the Internet or mobile devices or some other new channel, IT management is always the wet blanket, having to explain why (despite the company's investment in all the latest software and hardware) it will take 18 months to implement the new plan.

With SOA, business and IT have a way to meet each other half-way and collaborate using a business focused approach to develop new ways to use technology to grow the firm, help to spot new trends and opportunities, and see new ideas to fruition. But before you go marching off to save the world, though, we have some more explaining to do. A story will help.

A SOA Case Study

Once upon a time, there was an insurance company called ABC Insurance Incorporated. When ABC was born — oh, maybe 150 years ago — it began by selling insurance policies to factories and manufacturers. In those days, there were no computers to mess things up. The company followed business processes that were pretty simple. A nice person sent a letter inquiring about a policy. A smart person set a rate, sold a policy, and hoped that nothing caught fire or blew up. ABC thrived for more than 100 years.

But then, things got complicated. Other companies started stealing ABC's business. Customers were asking for insurance for different kinds of risk. ABC had to change or die.

ABC was an early user of punch-card accounting systems. In the 1960s, ABC bought computers, hired programmers, and built software applications to support its business. In the 1980s, it bought software packages from different

suppliers to help it continue to compete. It bought or built business applications to solve problems all over the company — one at a time. For example, it bought an application for the corporate finance department, created one to handle customer claims, and procured other applications to manage research information about what type of accidents were most common under what circumstances.

This worked well for many years, until the 1990s, when ABC found itself competing against financial services companies who decided *they* could sell insurance, too. Suddenly, ABC needed to find new ways to compete so it could sell a larger variety of products to current customers and also find some new customers. Its leaders thought up exciting new solutions based on the knowledge of their business and their customers.

In addition, management thought ABC could expand its business by acquiring other insurance companies with complementary products. ABC could sell these new products to existing ABC customers and sell ABC's products to the customers of the companies they acquired. These smart guys and gals understood business strategy. Everyone got really excited until . . .

Management talked to IT, and IT said, "This is really, really exciting, but we have a *small* problem."

"What could it be?" asked management.

"It's this," said IT. "We can no longer simply buy or build more software applications to implement our innovative plans for new products and services. The business policies and processes that we follow have become more complex. Everything we want to do has to work in concert with what we already have. The very running of our company depends on all the business applications that we built and acquired over years working together smoothly — such as the programs that tally the premiums people pay; administer the claims we process; and make risk analysis, payroll, invoicing, and sales commission calculations. When you come right down to it, our company is the aggregation of all our programs. Everything we need to carry out our day-to-day business functions — including information about our customers, our products, and our risk performance — is locked inside these programs and processes."

"Well," said management, "You can just write new programs to tie everything together. We'll *integrate*, and we'll all be very happy."

And IT said, "Yes, it is possible to *integrate*, but integrating will take a *very, very long time*: at least 18 months. Maybe two years. And by then, you might want more changes that will take another 18 months or two years. By then, it might be too late. And," IT continued, "*it will cost lots and lots of money.*"