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## Reference Point: Requirements Exploration and Modeling by Ellen Gottesdiener

### Expanded article

Software development is about understanding and satisfying our customers. That means much is at stake. In addition to credibility fallout with customers, requirements problems can generate expensive downstream changes (estimates range from 28% to 42.5% of your overall project costs). In other words, requirements are a worthy topic to address.

Translating customer requests into software requires exploration, learning, and discovery. As such, this Reference Point focuses primarily on **requirements exploration** and **modeling**. Requirements exploration involves eliciting, acquiring, prioritizing, negotiating, validating, and verifying requirements. Requirements modeling involves representing requirements using a variety of visual or text (or both) techniques, analyzing those models, and specifying requirements in detail.

In practice, requirements exploration and modeling work in tandem. Together, they involve the process of learning what to build – often the most elusive part of software development. Here you'll find my top recommendations for books, journals, and online resources on the subject.

#### ***Requirements Essentials: Getting a Grip***

*Here are what I consider to be the top three books on requirements as a whole.*

#### **Requirements Engineering: A Good Practice Guide, Ian Sommerville and Pete Sawyer**

SBN 0471974447, John Wiley & Sons, 1997, \$65.00, 404 pp.

A quick and easy-to-read reference to all the essentials of requirements engineering. It presents guidelines for the requirements engineering practitioner.

[www.stickyminds.com/sitewide.asp?ObjectId=233&ObjectType=BOOK&Function=edetail](http://www.stickyminds.com/sitewide.asp?ObjectId=233&ObjectType=BOOK&Function=edetail)

#### **Software Requirements, 2<sup>nd</sup> Edition Karl E. Wiegers**

ISBN 0735618798, Microsoft Press, 2003, \$39.99, 350 pp.

Wiegers provides thorough, concise, and direct coverage of requirements modeling and management topics.

[http://www.amazon.com/exec/obidos/tg/detail/-/0735618798/qid=1046726471/sr=1-2/ref=sr\\_1\\_2/002-4549255-2152809?v=glance&s=books#product-details](http://www.amazon.com/exec/obidos/tg/detail/-/0735618798/qid=1046726471/sr=1-2/ref=sr_1_2/002-4549255-2152809?v=glance&s=books#product-details)

#### **Customer-Centered Products: Creating Successful Products Through Smart Requirements Management, Ivy Hooks and Kristen A. Farry**

ISBN 0814405681, AMACOM, 2000, \$35.00, 272 pp.

Aimed at business and IT managers, this book explains why and how to get things right the first time.

[www.stickyminds.com/books.asp?ObjectId=463&ObjectType=BOOK&Function=edetail](http://www.stickyminds.com/books.asp?ObjectId=463&ObjectType=BOOK&Function=edetail)

### ***Requirements Modeling and Exploration in General Resources Online***

#### **Requirements Engineering Online Mailing List**

Requirements engineering researchers and practitioners exchange ideas, asks and answer questions, and share references.

[www-staff.it.uts.edu.au/~didar/RE-online.html](http://www-staff.it.uts.edu.au/~didar/RE-online.html)

#### **Requireonautics Quarterly**

This publication is provided by the Requirements Engineering Specialist Group of the British Computer Society. The online journal has a nice mix of experience-based articles along with ongoing research topics.

[www.resg.org.uk/](http://www.resg.org.uk/) (click on "RQ")

#### **The StickyMinds.com Requirements Zone**

This selection of all the requirements content on the StickyMinds site contains many useful articles on requirements modeling and management.

[www.stickyminds.com](http://www.stickyminds.com) (click on "Requirements")

#### **Software-Engineer.Org**

This site includes access to software requirements engineering articles and links. Just select "Articles" from the navigation bar, then "Software Requirements Analysis" from the list of topics.

[www.software-engineer.org/](http://www.software-engineer.org/)

#### **Karl Wieggers' Web Site**

Software requirements expert Karl Wieggers' site has numerous articles on quality requirements practices as well as requirements templates.

[www.processimpact.com/pubs.shtml#requirements](http://www.processimpact.com/pubs.shtml#requirements)

#### **Ivy Hook's Web Site**

Ivy Hooks, a requirements expert with extensive experience in human and mission critical software for NASA and the U.S. Department of Defense provides numerous articles and presentations about the importance of quality requirements.

<http://complianceautomation.com/> (go to: Resources, then Papers)

#### **Online Newsletter The Rational Edge**

Rational Software's online monthly newsletter provides high quality articles on software development including requirements modeling and management.

[www.therationaledge.com/](http://www.therationaledge.com/)

#### **Online Newsletter from Telelogic**

Telelogic's monthly Newsbyte includes articles on both requirement modeling and management.

[www.telelogic.com/newsbyte/](http://www.telelogic.com/newsbyte/)

#### **The Requirements Management Place**

Al Davis' site includes his own requirements articles and a large requirements bibliography.

[www.rmplace.org](http://www.rmplace.org)

#### **The PSARE Site**

A site supporting Hatley, Hruschka, and Pirbhai's book on system architecture and requirements

engineering, geared primarily to modeling real-time systems.

[www.psare.com/](http://www.psare.com/)

### **IEEE Task Force on Requirements Engineering**

The IEEE Task Force on Requirements Engineering has links to requirements resources and organization.

[www.shu.ac.uk/tfre/web.links.html](http://www.shu.ac.uk/tfre/web.links.html)

### **NASA's Recommended Approach to Software Development**

The Software Engineering Lab (NASA) document includes two sections on requirements definition and analysis.

<http://sel.gsfc.nasa.gov/website/documents/online-doc/81-305new.pdf>

### **The CeBase Site**

The Center for Empirically-Based Software Engineering (CeBASE) site, established to help our industry go from fad to glad by validating empirical techniques and models.

[www.cebase.org/](http://www.cebase.org/)

### **Barry Boehm's WinWin Method**

Home of WinWin, Barry Boehm's method for requirements negotiation

<http://sunset.usc.edu/research/WINWIN/>

### **STQE Article on User Driven Design**

Don Gause and Brian Lawrence's article in the inaugural issue of *STQE* tells you why and how to make users the focus of requirements.

[www.stickyminds.com/sitewide.asp?ObjectId=2659&ObjectType=ART&Function=edetail](http://www.stickyminds.com/sitewide.asp?ObjectId=2659&ObjectType=ART&Function=edetail)

### **Agile Requirements Modeling Essays**

Various essays on agile requirements modeling are posted by Scott Ambler as well as resource links to agile modeling articles online.

[www.agilemodeling.com/essays/agileRequirements.htm](http://www.agilemodeling.com/essays/agileRequirements.htm)

### **The Business Rule Community**

Business rules are the heart of your functional requirements. The business rules community provides access to numerous articles on business rules and the Business Rules Journal.

[www.brcommunity.com](http://www.brcommunity.com)

### **Requirements Bibliography**

A comprehensive (Over 1100 entries) bibliography of books and articles on the topic of requirements provided by requirements expert Al Davis.

<http://www.uccs.edu/~adavis/reqbib.htm>

### **Resources In Print**

#### **Exploring Requirements: Quality Before Design, Donald C. Gause and Gerald M. Weinberg**

ISBN 0932633137, Dorset House Publishing, 1989, \$44.95, 320 pp.

The authors present a fun and straightforward look at the ambiguities of requirements and the human side of requirements elicitation. In so doing, they cut to the heart of what requirements elicitation is all about – discovery, exploration, negotiation, learning and conflict.

[www.stickyminds.com/books.asp?ObjectId=57&ObjectType=BOOK&Function=edetail](http://www.stickyminds.com/books.asp?ObjectId=57&ObjectType=BOOK&Function=edetail)

#### **Mastering the Requirements Process, Suzanne Robertson and James Robertson**

ISBN 0201360462, Addison Wesley, 2000, \$47.99, 320 pp.

The Robertsons combine process with modeling by explaining how to gather (or as they call it "trawl") and verify requirements. The book includes a detailed explanation of their Volere

requirements specification template.

[www.stickyminds.com/books.asp?ObjectId=384&ObjectType=BOOK&Function=edetail](http://www.stickyminds.com/books.asp?ObjectId=384&ObjectType=BOOK&Function=edetail)

**Software Requirements: Styles and Techniques, Soren Lauesen**

ISBN 0201745704, Addison Wesley, 2001, \$39.99, 608 pp.

The author provides a survey of requirements techniques, including several approaches useful for customer and commercial off-the-shelf (COTS) software, good coverage of requirements quality and management, and requirements elicitation techniques.

<http://btobshop.barnesandnoble.com/textbooks/booksearch/isbnInquiry.asp?userid=17O2NTQ SXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y&isbn=0201745704>

**Practical Software Requirements, Benjamin L. Kovitz**

ISBN 1884777597, Manning Publications Company, 1998, \$47.95, 426 pp.

A unique requirements style guide that draws from Jackson's concept of a "problem frame" and focuses on using appropriate requirements models and solving the right problem.

[www.stickyminds.com/books.asp?ObjectId=341&ObjectType=BOOK&Function=edetail](http://www.stickyminds.com/books.asp?ObjectId=341&ObjectType=BOOK&Function=edetail)

**IEEE Software Magazine**

This bimonthly journal blends theory into practice with frequent articles on or related to requirements. The journal includes a Requirements column edited by Suzanne Robertson.

<http://computer.org/software/index.shtml>

**Problem Frames and Methods: Structuring and Analyzing Software Development Problems, Michael Jackson**

ISBN 020159627X, Addison Wesley, 2000, \$49.99, 416 pp.

A concise and intense treatment of requirements that focuses on understanding problems before solutions. Problem frames are patterns for managing separation of concerns, a key concept in requirements engineering.

<http://btobshop.barnesandnoble.com/textbooks/booksearch/isbnInquiry.asp?userid=17O2NTQ SXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y&isbn=020159627X>

**Requirements Pattern: Succeeding in the Internet Economy, Patricia Ferdinandi**

ISBN 0201738260, Addison Wesley, 2001, \$39.99, 528 pp

How to create complete and correct requirements based on the Zachman framework with an excellent set of questions to ask for each focus and perspective of requirements.

<http://btobshop.barnesandnoble.com/booksearch/isbnInquiry.asp?userid=17O2NTQ SXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y&isbn=0201738260>

**Managing Software Requirements: A Unified Approach, Dean Leffingwell and Don Widrig**

ISBN 0201615932 Addison Wesley, 1999, \$49.95, 528 pp.

Comprehensive coverage of requirements management and modeling emphasizing requirements processes advocated in the Unified Process.

[www.stickyminds.com/books.asp?ObjectId=454&ObjectType=BOOK&Function=edetail](http://www.stickyminds.com/books.asp?ObjectId=454&ObjectType=BOOK&Function=edetail)

**Requirements Engineering: Processes and Techniques, Ian Sommerville**

ISBN 0471972088, John Wiley & Sons, 1998, \$80.00, 282 pp

An easy to read and concise textbook addressing the stages of requirements engineering along with an introduction to a variety of requirements modeling techniques.

<http://btobshop.barnesandnoble.com/textbooks/booksearch/results.asp?TTL=Requirements+Engineering%3A+Processes+and+Techniques&userid=17O2NTQ SXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y>

**Software Requirements Engineering, 2nd Edition Richard H. Thayer, Sidney Bailin, and M. Dorfman**

ISBN 0818677384, IEEE Computer Society Press, 1997, \$60.00, 600 pp

A collection of some of the best articles in requirement engineering.

<http://btobshop.barnesandnoble.com/textbooks/booksearch/isbnInquiry.asp?userid=17O2NTQSXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y&isbn=0818677384>

### **Crosstalk**

This monthly journal of defense software engineering often includes features on the topic of requirements.

[www.stsc.hill.af.mil/](http://www.stsc.hill.af.mil/)

### **STQE, The Software Testing and Quality Engineering Magazine**

This bimonthly publication often features topics on requirements exploration and management.

[www.stqemagazine.com](http://www.stqemagazine.com)

### **Requirements Modeling and Exploration Techniques Modeling with Use Cases and Scenarios**

#### **UseCases.Org**

Alistair Cockburn's site contains resources, information, and links on use cases.

[www.usecases.org](http://www.usecases.org)

### **Technical Papers by Ian F. Alexander**

As the name suggests, this site contains Ian Alexander's technical papers, many of which discuss use cases and scenarios.

<http://easyweb.easynet.co.uk/~iany/consultancy/papers.htm>

### **Writing Effective Use Cases, Alistair Cockburn**

ISBN 0201702258, Addison Wesley, 2000, \$34.95, 304 pp.

This is a well-written, practical guide for writing goal-oriented use cases that includes advice on how to scope use case along with useful style suggestions.

[www.stickyminds.com/books.asp?ObjectId=426&ObjectType=BOOK&Function=edetail](http://www.stickyminds.com/books.asp?ObjectId=426&ObjectType=BOOK&Function=edetail)

### **Use Cases: Requirements in Context, Daryl Kulak and Eamonn Guiney**

ISBN 0201657678, Addison Wesley, 2000, \$34.95, 352 pp.

The authors' readable and useful treatment of use cases presents an iterative approach to use cases along with numerous examples.

<http://btobshop.barnesandnoble.com/textbooks/booksearch/isbnInquiry.asp?userid=17O2NTQSXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y&isbn=0201657678>

### **Applying Use Cases: A Practical Guide, Geri Schneider and Jason Winters**

ISBN: 0201708531, Addison Wesley, 2001, 2<sup>nd</sup> edition, \$34.95, 272 pp.

<http://btobshop.barnesandnoble.com/textbooks/booksearch/isbnInquiry.asp?userid=17O2NTQSXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y&isbn=0201708531>

### **Advanced Use Case Modeling: Software Systems, Frank Amour and Granville Miller**

ISBN: 0201615924, Addison Wesley, 2001, \$34.95, 464 pp.

<http://btobshop.barnesandnoble.com/textbooks/booksearch/isbnInquiry.asp?userid=17O2NTQSXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y&isbn=0201615924>

### **White Paper from Rational**

Describes the relationship between features and use cases with a brief discussion of the importance of separation problem from solution domain and tracing requirements.

[www.rational.com/products/whitepapers/featucregom.pdf](http://www.rational.com/products/whitepapers/featucregom.pdf)

### **The Use Case Zone**

Links and information on use cases.

[www.pols.co.uk/usecasezone](http://www.pols.co.uk/usecasezone)

### **User-Center Requirements and Design**

**Software for Use: A Practical Guide to the Models and Methods of Usage Centered Design,**

**Larry Constantine and Lucy Lockwood**

ISBN 0201924781 Addison Wesley, 1999, \$44.95, 368 pp.

This book provides a complete approach to requirements modeling that is focused on user tasks.

[www.stickyminds.com/books.asp?ObjectId=323&ObjectType=BOOK&Function=edetail](http://www.stickyminds.com/books.asp?ObjectId=323&ObjectType=BOOK&Function=edetail)

### **Contextual Design: Defining Customer-Centered Systems, Hugh Beyer and Karen Holtzblatt**

ISBN 1558604111, Morgan Kaufmann Publishers, 1997, \$46.95, 472 pp.

The authors provide their approach to requirements and design that involves "in context" interviewing (watching and questioning users in their actual workspaces) followed by modeling workshops and interface prototypes.

<http://btobshop.barnesandnoble.com/textbooks/booksearch/results.asp?TTL=Contextual+Design%3A+Defining+Customer%2DCentered+Systems&userid=17O2NTQ SXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y>

### **User-Centered Requirements: The Scenario-Based Engineering Process, Karen L. McGraw and Karan Harbison**

ISBN 0805820647, Lawrence Erlbaum Associates, Inc., 1997, \$89.95, 384 pp.

This book describes the authors' scenario-based engineering process, which centers on user scenarios elicited via workshops, interviews, and field observations.

<http://btobshop.barnesandnoble.com/textbooks/booksearch/isbnInquiry.asp?userid=17O2NTQ SXU&mscssid=NGB2BE72BN5N9K15CL9SBKFMJBKEBK49&btob=Y&isbn=0805820647>

### **The Constantine & Lockwood, Ltd. Web Site**

Larry Constantine and Lucy Lockwood's site has numerous articles on use cases and scenarios as applied to user interface design.

[www.foruse.com/Resources.htm](http://www.foruse.com/Resources.htm)

