

GIANT

Book of RE Techniques

108 techniques that every
requirements engineer should
know.

LN Mishra

CPRE, CBAP, CSM, LSBB, SPOC

Copyright notice

BABOK®, CBAP®, CCBA® are registered trademarks of International Institute of Business Analysis, Canada.

CPRE® is registered Trademarks of International Requirements Engineering Board, Germany.

All trademarks of copyrights mentioned herein are the possession of their respective owners.

We make no claim of ownership by the mention of products that contain these marks.

Contents of this document should not be disclosed to any unauthorized person.

This document may not, in whole or in part, be reduced, reproduced, stored in a retrieval system, translated, or transmitted in any form or by any means, electronic or mechanical.

Table of contents

Copyright notice	2
1. Introduction	11
2. 3 bucket technique for requirements scoping	14
3. 6356 technique	15
4. Acceptance criteria	15
5. Active listening	16
6. Activity diagrams	17
7. Affinity diagram	19
8. Apprenticing	20
9. Audio and video recordings	21
10. Baselineing	21
11. Bionics	22
12. Brainstorming	23
13. Brainstorming paradox	25
14. Brain-writing	26
15. Business rules analysis	26
16. Business rules catalog	28
17. Change of perspectives : 6 thinking hats	29
18. Checklists	32
19. Class model	33
20. Commenting, aka informal review, expert opinion	35
21. Communication model	35
22. Concept model	37
23. Configuration management system (CMS)	38
24. Conflict resolution	39
25. Context diagram	41
26. CRC Cards	42
27. CRUD Matrix	44
28. CURIE Matrix	44
29. Data dictionary and glossary	45
30. Data flow diagrams	47
31. Data model	48
32. Deep structure discovery	50

Giant book of requirements engineering techniques

33.	Delphi	53
34.	Display action response	54
35.	Document analysis	56
36.	Email listeners	58
37.	Entity relationship diagram	59
38.	Estimation techniques	60
39.	Feature model / Feature tree	63
40.	Focus groups	64
41.	Functional decomposition	68
42.	Functional requirements analysis	69
43.	Fusion model	71
44.	Goal Modeling	72
45.	Impact analysis	74
46.	Implicit requirements analysis	75
47.	Inspection, aka formal / technical review	76
48.	Interface analysis	79
49.	Interviews	80
50.	Job analysis	83
51.	Kano model	84
52.	Lessons learned process	85
53.	Logical data model	86
54.	Matrix Model	87
55.	Meeting techniques	89
56.	Mind-mapping	91
57.	Misuse case	91
58.	MoSCoW	92
59.	Multi-voting	93
60.	Non-Functional requirements	94
61.	Observation	96
62.	Organization modeling	98
63.	Package diagram	101
64.	Persona	101
65.	Perspective-based reading	102
66.	Physical data model	104
67.	Post it notes	105

Giant book of requirements engineering techniques

68.	Problem tracking	105
69.	Process modeling	108
70.	Prototyping	111
71.	RACI matrix	115
72.	Ranking and Top-ten technique	115
73.	Release planning	117
74.	Report table	117
75.	Requirements attribute chart	120
76.	Requirements modeling chart	123
77.	Requirements prioritization techniques	125
78.	Requirements warehouse	127
79.	Requirements workshops	128
80.	Retrospectives	131
81.	Requirements reuse	133
82.	Reverse walkthrough	134
83.	Rich picture	134
84.	Risk management	136
85.	Root cause analysis (RCA)	138
86.	Round robin	140
87.	Scope models	141
88.	Sequence diagrams	144
89.	Sign-off	146
90.	Sprint planning	147
91.	Sprint retrospective	147
92.	Sprint review	148
93.	Stakeholder list	149
94.	Stakeholder map	150
95.	State chart diagram	151
96.	State table	151
97.	Structured walkthrough	152
98.	Surveys and questionnaires	157
99.	System archaeology	162
100.	System interface table	163
101.	Time boxing	164
102.	Usability analysis	165

Giant book of requirements engineering techniques

103.	Use case diagram	165
104.	Use case specifications	168
105.	User stories	174
106.	Version control system (VCS)	175
107.	Walk-through, aka lightweight review	176
108.	Weiger' s matrix (Weighted average index)	176

About the Author

LN Mishra (LN) has 22+ years of professional experience in software development, requirements analysis, business analysis, governance, risk and compliance management (CMMI, ISO9001, ISO27001, HIPAA and Six-Sigma).

LN is a practicing business analyst for more than 18 years. He was involved in multiple multi-country large ERP implementation projects. He currently consults in development of 2 large systems - one of the largest paint companies in the world to develop their next generation color management system and development of a GRC system. He is also the product manager for an enterprise Governance, Risk and Compliance management system (GRCPeak) which is operational in multiple client places. He was involved in one of the world's change management program in PricewaterhouseCoopers, a leading management consulting firm, in one of the largest privatization effort in India for a public sector utility agency.

LN has conducted more than 100 workshops, both public and in house in the areas of Business Analysis, Requirements Management, Agile Project Management, software Project Management, Six Sigma, CMM, ISO 9001 and ISO 27001. He has also guided 30+ six sigma green belt projects in iGate, MACH and Akzo Nobel.

LN holds a Post Graduate Diploma in Management (PGDM) from IIM Ahmedabad, the top-most business management school in India and Bachelor in Engineering (Honours) in Electronics and Telecommunication from University College of Engineering, Burla, India.

Giant book of requirements engineering techniques

Major Awards/Recognitions:

- ✓ Certified Business Analyst Professional (CBAP®) from IIBA, Canada.
- ✓ Certified Requirements Engineering Professional (CPRE) from IREB, Germany.
- ✓ Certified Project Management Professional (PMP) from PMI, USA.
- ✓ Certified Scrum Master from Good Agile, USA.
- ✓ World Topper Certified software Quality Analyst (CSQA), 2000.
- ✓ Certified Lead Auditor for ISO 9001, ISO 27001, ISO 20000 and BS 25999.

LN lives with his wife, Ananya, son, Siddharth and daughter, Saianshee in Bangalore, the IT capital of India.

About Adaptive Processes Consulting

Adaptive Processes is formed with a view to help organizations establish and improve requirements engineering practices.

Our values



Key facts

- ✓ World' s most innovative requirements engineering solutions organization.
- ✓ 200+ person-years consulting experience in developing and improving systems based on BABOK, Agile, CMMI, ISO 9K, 27K, 20K, and HIPAA.
- ✓ 200+ Clients across the globe.
- ✓ More than 10 Fortune 500 clients.
- ✓ Successfully conducted 200+ workshops in India, US, Thailand, Philippines, Malaysia.
- ✓ Online sessions for world-wide audiences.
- ✓ 10+ International partners.

Recognitions

- ✓ Red Herring Top 100 finalist for Asia – 2014
- ✓ Winner of Deloitte 2013 Technology Fast 500 for Asia Pacific
- ✓ Winner of Deloitte 2013 Technology Fast 50.
- ✓ Winner of Most Innovative Company Award from Pan IIT-IIM Alumni Forum.
- ✓ Certified Microsoft BizSpark Partner.
- ✓ Nominated for prestigious Tata NEN Hottest Start-up.



Giant book of requirements engineering techniques

Adaptive' s strategic partners



Organization Name	Focus	Logo
IREB (International Requirements Engineering Board), Germany www.ireb.org	World' s leading certification body for CPRE _{FL} and CPRE _{AL}	
IIBA (International Institute of Business Analysis), Canada www.iiba.org	World' s leading body on Business Analysis.	
SCRUMstudy, USA www.scrumstudy.com	Best in scrum certification and Agile certification.	

1. Introduction

1.1. Why this book?

As I have been practicing requirements engineering for close to 20 years, I have come across many tools that requirements engineers use while conducting requirements engineering activities.

I decided to compile all the tools that I came across and find useful.

Hopefully this can serve as a good guidebook for both new and experienced requirements engineer.

If you come across any new technique that you find useful during requirements engineering, do write to me. I will include the same in my book.

1.2. Other sources of requirements engineering information

1. Syllabus for CPRE Foundation Level examination, IREB, Germany
2. A Guide to Business Analysis Body of Knowledge v2.0. International Institute of Business Analysis. Toronto: IIBA, 2009. PDF and EBook.
3. A Guide to Business Analysis Body of Knowledge v3.0. International Institute of Business Analysis. Toronto: IIBA, 2009. PDF and EBook.
4. Project Management Institute, Project Business Analysis Guide.
5. Business Analysis, Debra and Paul, British Computer Society.
6. CMMI for Development, Carnegie Mellon University.
7. ISO 9001:2008 from ISO.
8. System Engineering Body of Knowledge, IEEE.
9. Enterprise architecture (including Zachman Framework for Enterprise architecture™, and TOGAF™).
10. Governance, and Compliance Frameworks, including Sarbanes-Oxley, Basel II, and others.
11. IT Service Management (including ITIL).
12. Rupp, Klaus Pohl and Chris. A Study Guide for the Certified Professional for Requirements Engineering Exam Foundation Level 2nd Edition. Rocky Nook Inc., 2015. Kindle and Paperback.
13. Podeswa, Howard. The Business Analyst's Handbook. Boston: Course Technology, 2009.

Giant book of requirements engineering techniques

14. UML for the IT Business Analyst, Second Edition. Boston: Course Technology, 2010.
15. James Cadle, Debra Paul and Paul Turner. Business Analysis Techniques. Chippenham: British Informatics Society Limited, 2010.

2. 3 bucket technique for requirements scoping

3 bucket technique is a very simple technique to put requirements into 3 buckets. The 3 buckets are:

1. Green bucket - Items in scope
2. Yellow bucket - Items about which it is not clear whether they are in scope or not
3. Red bucket - Items out of scope

3 Box diagram for requirements scoping

In scope	Yet to be decided	Out of scope
Schedule management Defect management Risk management Issue management Metrics management Audit management	Skill management Billing	Recruitment management Compensation management Accounting Asset management

Advantages

- ✓ Simple visual technique.

Disadvantages

- ✓ None.

3. 6356 technique

6356 is a simple and structured brainstorming technique. In this technique, each participant is asked to generate 3 ideas every 5 minutes. The session is carried out for 30 minutes.

Choose	Every	Each participant gives	Repeat this process for
6	5	3	6
Participants	Minutes	Ideas	times

Advantages

- ✓ Generates 100+ ideas in just 30 minutes time.

Disadvantages

- ✓ None.

4. Acceptance criteria

Acceptance criteria describe minimal set of requirements to be met for a solution to be worth implementing.

Typically used when only one possible solution is being evaluated, and expressed as pass or fail. Evaluation criteria are set of requirements used to choose between multiple solutions options, solutions or solution components. This allows for a range of possible scores.

Scoring is the process of determining how well a solution meets a requirement. Business analyst must establish a scale for scoring each requirement, and define multiple possible scoring levels. Stakeholders must agree on the criteria, and how solutions will be rated against them. Ranking is the process of determining the order of importance for all requirements using MoSCoW technique. Acceptance and evaluation criteria must be testable.

Advantages

- ✓ Agile methodologies require requirements to be expressed as testable acceptance criteria.
- ✓ Necessary when requirements express contractual obligations.

Disadvantages

- χ May express contractual obligations, and difficult to change for legal or political reasons.

5. Active listening

Communication is very vital activity for BAs. Listening as a skill is extremely important for business analysis. Most often we hear, rather than listen. When we hear, we are not fully immersed in the conversation and tend to lose vital information being communicated from stakeholders. Active listening is listening with all senses.

Active listening involves:

1. Paying undivided attention to the speaker,
2. Suspending all judgment about what is being heard,

3. Asking questions when something is not clear without creating conflicts,
4. Paraphrasing back what is discussed,
5. Do a check on implicit requirements.

Advantages

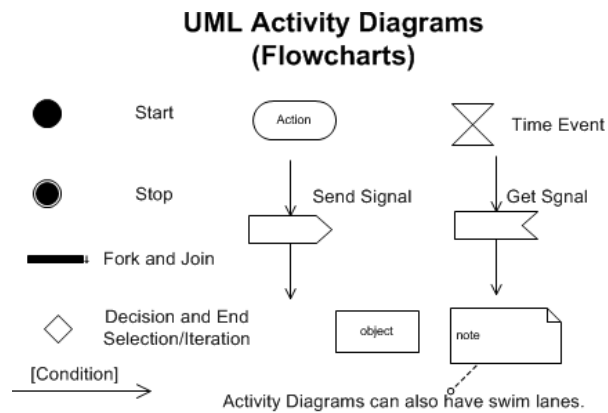
- ✓ Reduces communication gap significantly.

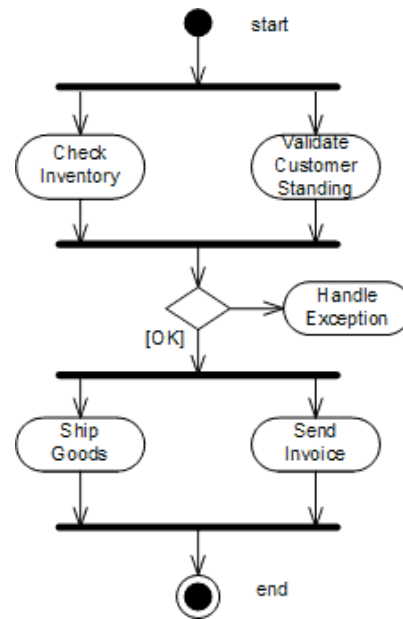
Dis-advantages

- χ None.

6. Activity diagrams

UML activity diagrams model action sequences.





Action nodes

Action nodes execute an action. Start nodes initiate execution of activity diagram. End nodes represent termination of activity diagram.

Control flows, object flows, responsibilities

Alternative control flows in activity diagrams are achieved through use of decision nodes. Synchronization bars depict concurrent execution of control flows.

Swim lanes are informal modeling where activities are placed along the lines of roles / actors responsible.

Advantages

✓ Provides clarity on actions carried out in a process.

Dis-advantages

χ None.

7. Affinity diagram

Affinity diagrams cluster categories and subcategories of ideas that have an affinity to each other. Affinity diagrams are useful for generating common themes when faced with number of unorganized findings.



Advantages

- ✓ Helps to connect related issues of a problem or opportunity.
- ✓ Helps to understand root causes and possible solutions to problems.
- ✓ Helps in generating necessary capabilities to address a problem or opportunity.
- ✓ Prevents any one person from having undue influence on the outcome.

Disadvantages

- χ None.

8. Apprenticing

During apprenticing, requirements engineers collect requirements by becoming an apprentice in the stakeholder's work environment. This is useful for

- ✓ Documenting details about current processes.
- ✓ When the project's objective is to enhance or change a current process.

Steps for apprenticing

Prepare for apprentice

1. Determine activities to apprentice.
2. Identify a mentor for apprenticeship.

Learn

1. Learn safety aspects
2. Learn the process.

Be the apprentice

1. Execute tasks under mentor's guidance.
2. Record requirements.

Review requirements

1. Provide a summary of notes to the stakeholders, as soon as possible, for review, and any clarifications.
2. Review findings with the entire group to validate requirements.

Advantages

- ✓ Provides realistic, and practical insight into business processes.
- ✓ Elicits details of informal communication.

- ✓ Identify workarounds which may not be documented.

Disadvantages

- χ Possible for existing processes only.
- χ Time-consuming.

9. Audio and video recordings

Audio and video recordings are helpful to preserve discussions for future reference. Take approval of stakeholders prior to recording the discussions.

Many internet based screen sharing software allow recording of the discussions.

Advantages

- ✓ Helps in reviewing requirements in future.

Disadvantages

- χ Needs additional resources.
- χ Some stakeholders may not like the discussions to be recorded.

10. Baselineing

A baseline is a set of approved configuration items at a specific period of times.

Configuration items within a baseline are not modified further without a change in their version numbers.

Baselines are hence read only copies for the team.

Advantages

- ✓ Helps to ensure build stable versions of the solution.

Disadvantages

- χ None.