



Mastering the Requirements Process

Second
Edition

SUZANNE ROBERTSON
JAMES ROBERTSON



Mastering the Requirements Process

Second Edition

Mastering the Requirements Process

Table of Contents

Contents

Preface to the Second Edition

Foreword to the First Edition

Acknowledgments

1 What Are Requirements? in which we consider why we are interested in requirements

Requirements Gathering and Systems Modeling

Agile Software Development

Why Do I Need Requirements?

What Is a Requirement?

Functional Requirements

Nonfunctional Requirements

Constraints

Evolution of Requirements

The Template

The Shell

The Volere Requirements Process

2 The Requirements Process: in which we look at a process for gathering requirements and discuss how you might use it

Agility Guide

Requirements Process in Context

The Process

A Case Study

Table of Contents

Project Blastoff

Trawling for Requirements

Prototyping the Requirements

Scenarios

Writing the Requirements

The Quality Gateway

Reusing Requirements

Reviewing the Specification

Iterative and Incremental Processes

Requirements Retrospective

Your Own Requirements Process

In Conclusion

3 Project Blastoff: in which we establish a solid foundation for the requirements, and ensure that the members of the project team all start rowing in the same direction

Agility Guide

IceBreaker

Scope, Stakeholders, Goals

Setting the Scope

Domains of Interest

First-Cut Work Context

Stakeholders

The Client

The Customer

The Users: Get to Know Them

Other Stakeholders

Consultants

Management

Table of Contents

Subject Matter Experts

Core Team

Inspectors

Market Forces

Legal

Negative Stakeholders

Industry Standard Setters

Public Opinion

Government

Special-Interest Groups

Technical Experts

Cultural Interests

Adjacent Systems

Finding the Stakeholders

Goals: What Do You Want to Achieve?

Keeping Track of the Purpose

Requirements Constraints

Solution Constraints

Project Constraints

Naming Conventions and Definitions

How Much Is This Going to Cost?

Risks

To Go or Not to Go

Blastoff Alternatives

Summary

4 Event-Driven Use Cases: in which we discuss a fail-safe way of partitioning the work into use cases, and along the way discover the best product to build

Agility Guide

Table of Contents

Understanding the Work

Use Cases and Their Scope

The Work

The Context of the Work

The Outside World

Business Events

Time-Triggered Business Events

Why Business Events and Business Use Cases Are a Good Idea

Finding the Business Events

Business Use Cases

The Role of Adjacent Systems

Active Adjacent Systems

Autonomous Adjacent Systems

Cooperative Adjacent Systems

Business Use Cases and Product Use Cases

Actors

Summary

5 Trawling for Requirements: in which we drag the net through the work area looking for requirements, and discuss some useful techniques for doing so

Agility Guide

Responsibility

The Requirements Analyst

Trawling and Business Use Cases

The Role of the Current Situation

Apprenticing

Observing Structures and Patterns

Interviewing the Stakeholders

Table of Contents

Asking the Right Questions

Getting to the Essence of the Work

Solving the Right Problem

Innovative Products

Business Use Case Workshops

Outcome

Scenarios

Business Rules

Creativity Workshops

Brainstorming

Personas

Mind Maps

Wallpaper

Video and Photographs

Wikis, Blogs, and Discussion Forums

Document Archeology

Some Other Requirements-Gathering Techniques

Family Therapy

Soft Systems and Viewpoints

Determining What the Product Should Be

The True Origin of the Business Event

Does Technology Matter?

Choosing the Best Trawling Technique

Summary

6 Scenarios and Requirements: in which we look at scenarios as a way of helping the stakeholders to discover their requirements

Agility Guide

Scenarios

Table of Contents

Normal Case Scenarios

Diagramming the Scenario

Alternative Cases

Exception Cases

What If? Scenarios

Misuse Cases and Negative Scenarios

Scenario Template

Product Use Case Scenarios

Summary

7 Functional Requirements: in which we look at those requirements that cause the product to do something

Agility Guide

Functional Requirements

Finding the Functional Requirements

Level of Detail or Granularity

Exceptions and Alternatives

Avoiding Ambiguity

Technological Requirements

Requirements, Not Solutions

Grouping Requirements

Alternatives to Functional Requirements

Summary

8 Nonfunctional Requirements: in which we look at those requirements that specify how well your product does what it does

Agility Guide

Nonfunctional Requirements

Table of Contents

Use Cases and Nonfunctional Requirements

The Nonfunctional Requirements

Look and Feel Requirements: Type 10

Usability and Humanity Requirements: Type 11

Performance Requirements: Type 12

Operational and Environmental Requirements: Type 13

Maintainability and Support Requirements: Type 14

Security Requirements: Type 15

Confidentiality

Availability

Integrity

Auditing

. . . And No More

Cultural and Political Requirements: Type 16

Legal Requirements: Type 17

Sarbanes-Oxley Act

Other Legal Obligations

Standards

Finding the Nonfunctional Requirements

Blogging the Requirements

Use Cases

The Template

Prototypes and Nonfunctional Requirements

The Client

Don't Write a Solution

Summary

9 Fit Criteria: in which we show how measuring a requirement
makes it unambiguous, understandable, and, importantly, testable

Agility Guide

Table of Contents

Why Does Fit Need a Criterion?

Scale of Measurement

Rationale

Fit Criteria for Nonfunctional Requirements

- Product Failure?

- Subjective Tests

- Look and Feel Requirements

- Usability and Humanity Requirements

- Performance Requirements

- Operational Requirements

- Maintainability Requirements

- Security Requirements

- Cultural and Political Requirements

- Legal Requirements

Fit Criteria for Functional Requirements

- Test Cases

Use Cases and Fit Criteria

Fit Criterion for Project Purpose

Fit Criteria for Solution Constraints

Summary

10 Writing the Requirements: in which we turn the requirements
into written form

Agility Guide

Turning Potential Requirements into Written Requirements

Knowledge Versus Specification

The Volere Requirements Specification Template

1 The Purpose of the Project

- 1a: The User Business or Background of the Project Effort

- 1b: Goals of the Project

Table of Contents

2 The Client, the Customer, and Other Stakeholders

2a: The Client

2b: The Customer

2c: Other Stakeholders

3 Users of the Product

4 Mandated Constraints

4a: Solution Constraints

4b: Implementation Environment of the Current System

4c: Partner or Collaborative Applications

4d: Off-the-Shelf Software

4e: Anticipated Workplace Environment

4f: Schedule Constraints

4g: Budget Constraints

5 Naming Conventions and Definitions

5a: Definitions of All Terms, Including Acronyms, Used in the Project

5b: Data Dictionary for Any Included Models

6 Relevant Facts and Assumptions

6a: Facts

6b: Assumptions

7 The Scope of the Work

7c: Work Partitioning

8 The Scope of the Product

8a: Product Boundary

8b: Product Use Case List

8c: Individual Product Use Cases

The Shell

Snow Cards

Automated Requirements Tools

The Atomic Requirement

Table of Contents

Requirement Number

Requirement Type

Event/Use Case Number

Description

Rationale

Originator

Fit Criterion

Customer Satisfaction and Customer Dissatisfaction

Priority

Conflicts

Supporting Materials

History

Writing the Specification

9 Functional Requirements

Description

Nonfunctional Requirements

Project Issues

18 Open Issues

19 Off-the-Shelf Solutions

20 New Problems

21 Tasks

22 Migration to the New Product

23 Risks

24 Costs

25 User Documentation and Training

26 Waiting Room

27 Ideas for Solutions

Summary

11 The Quality Gateway: in which we prevent unworthy

Table of Contents

requirements becoming part of the specification

Agility Guide

Requirements Quality

Using the Quality Gateway

Testing Completeness

Are There Any Missing Components?

Meaningful to All Stakeholders?

Testing Traceability

Consistent Terminology

Relevant to Purpose?

Testing the Fit Criterion

Viable within Constraints?

Requirement or Solution?

Customer Value

Gold Plating

Requirements Creep

Requirements Leakage

Implementing the Quality Gateway

Alternative Quality Gateways

Summary

12 Prototyping the Requirements: in which we use simulations to help find requirements

Agility Guide

Prototypes and Reality

Low-Fidelity Prototypes

High-Fidelity Prototypes

Storyboards

Object Life History

Table of Contents

The Prototyping Loop

Design and Build

Testing in the User Environment

Analyzing the Results

Summary

13 Reusing Requirements: in which we look for requirements that have already been written and explore ways to reuse them

What Is Reusing Requirements?

Sources of Reusable Requirements

Requirements Patterns

Christopher Alexander's Patterns

A Business Event Pattern

Context of Event Response

Processing for Event Response

Data for Event Response

Forming Patterns by Abstracting

Patterns for Specific Domains

Patterns Across Domains

Domain Analysis

Trends in Reuse

Reuse and Objects

Reuse Is Now a Job?

Summary

14 Reviewing the Specification: in which we decide whether our specification is correct and complete, and set the priorities of the requirements

Agility Guide

Reviewing the Specification

Table of Contents

Inspections

Find Missing Requirements

Have All Business Use Cases Been Discovered?

1. Define the Scope
2. Identify Business Events and Non-Events
3. Model the Business Use Case
4. Define the Business Data
5. CRUD Check
6. Check for Custodial Processes

Repeat Until Done

Customer Value

Prioritizing the Requirements

Prioritization Factors

When to Prioritize

Requirement Priority Grading

Prioritization Spreadsheet

Conflicting Requirements

Ambiguous Specifications

Risk Analysis

Project Drivers

Project Constraints

Functional Requirements

Measure the Required Effort

Summary

15 Whither Requirements? in which we consider some other issues for the requirements

Adapting the Process

What About Requirements Tools?

Mapping Tools to Purpose

Table of Contents

Publishing the Requirements

- Contractual Document

- Management Summary

- Marketing Summary

- User Review

- Reviewing the Specification

Requirements Traceability

- Tracing a Business Event

Dealing with Change

- Changes in the World

- Requirements Feedback

Requirements Retrospective

- What to Look For

- Running the Retrospective

- Retrospective Report

Your Notebook

The End

Appendix A: Volere Requirements Process Model: in which we present, for your reference, the complete Volere Requirements Process

The Volere Requirements Process Model

- Making This Work for You

- Finding More Information

- Define Blastoff Objectives (Process Notes 1.1.1)

- Plan Physical Arrangements (Process Notes 1.1.2)

- Communicate with Participants (Process Notes 1.1.3)

- Determine Project Purpose (Process Notes 1.2.1)

- Determine the Work Context (Process Notes 1.2.2)

- Do First-Cut Risk Analysis (Process Notes 1.2.3)

Table of Contents

Identify the Stakeholders (Process Notes 1.2.4)
Partition the Context (Process Notes 1.2.5)
Consider Non-Events (Process Notes 1.2.6)
Determine Business Terminology (Process Notes 1.2.7)
Define Project Constraints (Process Notes 1.2.8)
Identify Domains of Interest (Process Notes 1.2.9)
Write Blastoff Report (Process Notes 1.3.1)
Review Blastoff Results (Process Notes 1.3.2)
Hold Follow-Up Blastoff (Process Notes 1.3.3)
Make Initial Estimate (Process Notes 1.3.4)
Review Current Situation (Process Notes 2.1.1)
Apprentice with the User (Process Notes 2.1.2)
Determine Essential Requirements (Process Notes 2.1.3)
Brainstorm the Requirements (Process Notes 2.1.4)
Interview the Users (Process Notes 2.1.5)
Do Document Archaeology (Process Notes 2.1.6)
Make Requirements Video (Process Notes 2.1.7)
Run Use Case Workshop (Process Notes 2.1.8)
Build Event Models (Process Notes 2.1.9)
Build Scenario Models (Process Notes 2.1.10)
Run Creativity Workshop (Process Notes 2.1.11)
Study the Adjacent Systems (Process Notes 2.2.1)
Define Use Case Boundary (Process Notes 2.2.2)
Gather Business Event Knowledge (Process Notes 2.3.1)
Choose Appropriate Trawling Techniques (Process Notes 2.3.2)
Ask Clarification Questions (Process Notes 2.4)
Identify Potential Requirements (Process Notes 3.1)

Table of Contents

- Identify Functional Requirements (Process Notes 3.2)
- Identify Composite Requirements (Process Notes 3.3)
- Formalize Requirement (Process Notes 3.4)
- Formalize System Constraints (Process Notes 3.5)
- Identify Nonfunctional Requirements (Process Notes 3.6)
- Write Functional Fit Criteria (Process Notes 3.7)
- Write Nonfunctional Fit Criteria (Process Notes 3.8)
- Define Customer Value (Process Notes 3.9)
- Identify Dependencies and Conflicts (Process Notes 3.10)
- Review Requirement Fit Criteria (Process Notes 4.1)
- Review Requirement Relevance (Process Notes 4.2)
- Review Requirement Viability (Process Notes 4.3)
- Identify Gold-Plated Requirements (Process Notes 4.4)
- Review Requirement Completeness (Process Notes 4.5)
- Plan the Prototype (Process Notes 5.1)
- Build Low-Fidelity Prototype (Process Notes 5.2.1)
- Build High-Fidelity Prototype (Process Notes 5.2.2)
- Test High-Fidelity Prototype with Users (Process Notes 5.3.1)
- Test Low-Fidelity Prototype with Users (Process Notes 5.3.2)
- Identify New and Changed Requirements (Process Notes 5.3.3)
- Evaluate Prototyping Effort (Process Notes 5.3.4)
- Conduct Private Individual Reviews (Process Notes 6.1.1)
- Conduct Separate Meetings with Groups (Process Notes 6.1.2)
- Facilitator Reviews Facts (Process Notes 6.1.3)
- Hold Retrospective Review Meeting (Process Notes 6.2.1)
- Produce Retrospective Report (Process Notes 6.2.2)
 - Retrospective Report on Requirements Specification
- Identify Filtration Criteria (Process Notes 6.3.1)

Table of Contents

Select Relevant Requirement Types (Process Notes 6.3.2)
Add New Filtration Criteria (Process Notes 6.3.3)
Identify Missing Requirements (Process Notes 7.1.1)
Identify Customer Value Ratings (Process Notes 7.1.2)
Identify Requirement Interaction (Process Notes 7.1.3)
Identify Prototyping Opportunity (Process Notes 7.1.4)
Find Missing Custodial Requirements (Process Notes 7.1.5)
Look for Likely Risks (Process Notes 7.2.1)
Quantify Each Risk (Process Notes 7.2.2)
Identify Estimation Input (Process Notes 7.3.1)
Estimate Effort for Events (Process Notes 7.3.2)
Estimate Requirements Effort (Process Notes 7.3.3)
Design Form of Specification (Process Notes 7.4.1)
Assemble the Specification (Process Notes 7.4.2)
Dictionary of Terms Used in the Requirements Process Model

Appendix B: Volere Requirements Specification Template: a guide for writing a rigorous and complete requirements specification

Contents

Project Drivers
Project Constraints
Functional Requirements
Nonfunctional Requirements
Project Issues

Preamble

Volere

Requirements Types

Testing Requirements

Requirements Shell

Table of Contents

1 The Purpose of the Project

- 1a: The User Business or Background of the Project Effort
- 1b: Goals of the Project

2 The Client, the Customer, and Other Stakeholders

- 2a: The Client
- 2b: The Customer
- 2c: Other Stakeholders

3 Users of the Product

- 3a: The Hands-On Users of the Product
- 3b: Priorities Assigned to Users
- 3c: User Participation
- 3d: Maintenance Users and Service Technicians

4 Mandated Constraints

- 4a: Solution Constraints
- 4b: Implementation Environment of the Current System
- 4c: Partner or Collaborative Applications
- 4d: Off-the-Shelf Software
- 4e: Anticipated Workplace Environment
- 4f: Schedule Constraints
- 4g: Budget Constraints

5 Naming Conventions and Definitions

- 5a: Definitions of All Terms, Including Acronyms, Used in the Project
- 5b: Data Dictionary for Any Included Models

6 Relevant Facts and Assumptions

- 6a: Facts
- 6b: Assumptions

7 The Scope of the Work

- 7a: The Current Situation
- 7b: The Context of the Work
- 7c: Work Partitioning

Table of Contents

8 The Scope of the Product

8a: Product Boundary

8b: Product Use Case List

8c: Individual Product Use Cases

9 Functional and Data Requirements

9a: Functional Requirements

9b: Data Requirements

10 Look and Feel Requirements

10a: Appearance Requirements

10b: Style Requirements

11 Usability and Humanity Requirements

11a: Ease of Use Requirements

11b: Personalization and Internationalization Requirements

11c: Learning Requirements

11d: Understandability and Politeness Requirements

11e: Accessibility Requirements

12 Performance Requirements

12a: Speed and Latency Requirements

12b: Safety-Critical Requirements

12c: Precision or Accuracy Requirements

12d: Reliability and Availability Requirements

12e: Robustness or Fault-Tolerance Requirements

12f: Capacity Requirements

12g: Scalability or Extensibility Requirements

12h: Longevity Requirements

13 Operational and Environmental Requirements

13a: Expected Physical Environment

13b: Requirements for Interfacing with Adjacent Systems

13c: Productization Requirements

13d: Release Requirements

Table of Contents

14 Maintainability and Support Requirements

- 14a: Maintenance Requirements
- 14b: Supportability Requirements
- 14c: Adaptability Requirements

15 Security Requirements

- 15a: Access Requirements
- 15b: Integrity Requirements
- 15c: Privacy Requirements
- 15d: Audit Requirements
- 15e: Immunity Requirements

16 Cultural and Political Requirements

- 16a: Cultural Requirements
- 16b: Political Requirements

17 Legal Requirements

- 17a: Compliance Requirements
- 17b: Standards Requirements

18 Open Issues

19 Off-the-Shelf Solutions

- 19a: Ready-Made Products
- 19b: Reusable Components
- 19c: Products That Can Be Copied

20 New Problems

- 20a: Effects on the Current Environment
- 20b: Effects on the Installed Systems
- 20c: Potential User Problems
- 20d: Limitations in the Anticipated Implementation Environment That May
Inhibit the New Product
- 20e: Follow-Up Problems

21 Tasks

- 21a: Project Planning

Table of Contents

21b: Planning of the Development Phases

22 Migration to the New Product

22a: Requirements for Migration to the New Product

22b: Data That Has to Be Modified or Translated for the New System

23 Risks

24 Costs

25 User Documentation and Training

25a: User Documentation Requirements

25b: Training Requirements

26 Waiting Room

27 Ideas for Solutions

Appendix C: Function Point Counting: A Simplified Introduction:

in which we look at a way to accurately measure the size or functionality of the work area, with a view toward using the measurement to estimate the requirements effort

Measuring the Work

A Quick Primer on Counting Function Points

Scope of the Work

Data Stored by the Work

Business Use Cases

Counting Function Points for Business Use Cases

Counting Input Business Use Cases

Counting Output Business Use Cases

Counting Time-Triggered Business Use Cases

Counting the Stored Data

Internal Stored Data

Externally Stored Data

Adjust for What You Don't Know

What's Next After Counting Function Points?

Table of Contents

Appendix D: Project Sociology Analysis Templates: in which we
provide some help with finding the stakeholders for your project

Stakeholder Map Template

Stakeholder Analysis Template

Glossary

A

B

C

D

E

F

N

P

Q

R

S

T

U

V

W

Bibliography

Index