

Table of Contents

1	Introduction.....	1
1.1	Aim of Book1
1.2	Benefit to be gained from book.....	.1
1.3	Definition of terms.....	.2
1.4	Structure of the Book.....	.4
1.5	How to read this book.....	.7
2	Why Requirements Management and Engineering.....	11
2.1	General	11
2.2	Advantages of RM&E in project management	13
2.2.1	Advantages of project planning	13
2.2.2	Advantages during the implementation phase	14
2.2.3	Advantages during the acceptance phase	15
2.2.4	Advantages in regard to version and configuration management.....	15
2.3	Advantages for finding solutions in design and architecture.....	16
2.3.1	Advantages design and architecture	16
2.3.2	Advantages in finding solutions	17
2.4	Advantages in purchase and supplier management	18
2.5	Advantages in customer service, sales and marketing	18
2.6	Advantages in test and verification management.....	19
3	Processes and Methods in Requirements Management and Engineering.....	21
3.1	The roots of Requirements Management and Engineering.....	21
3.1.1	The progress in computer engineering	22
3.1.2	Programmers – from artists to facilitators.....	24
3.1.3	Requirements Management and Engineering today	27
3.2	Common concepts in Requirements Management and Engineering	29
3.2.1	The systems engineering concept.....	29
3.2.2	The requirements management concept	30
3.2.3	The process quality concept	31
3.3	Processes and methods in Requirements Management and Engineering	31
3.3.1	Requirements engineering	32
3.3.2	Requirements management.....	35
3.4	Summary	38
4	Introduction to Requirements Engineering.....	39
4.1	History of Requirements Engineering	39
4.2	HOOD Requirements Definition Process	42
4.2.1	Aim of this part	42
4.2.2	What is a Process?	43
4.2.3	The activities of the HOOD Requirements Definition Process	45
4.2.4	Modelling	45
4.3	Requirements Development and Requirements Engineering	55
4.4	Summary	57

5	Introduction to Requirements Management.....	59
5.1	What is Requirements Management	59
5.2	Why we need Requirements Management	59
5.3	The benefits of a working Requirements Management.....	65
5.4	Why some people are against Requirements Management.....	71
5.5	How resistance can be avoided	73
5.6	After the introduction of Requirement Management.....	76
5.7	Summary	77
6	Project Management interface.....	79
6.1	What is Project Management	79
6.2	How Requirements Management can support the writing of proposals	80
6.3	How Requirements Management can support the definition of the project scope	83
6.4	How Requirements Management can support estimating resources and costs.....	84
6.5	How Requirements Management can support project planning (scheduling)	85
6.6	How Requirements Management can support project monitoring.....	88
6.7	How Requirements Management can support quality management	90
6.8	How Requirements Management can support reporting	95
6.9	How Requirements Management can support managing people	96
6.10	Summary	98
7	Configuration Management interface.....	101
7.1	Of versions, configurations, and releases	102
7.2	Management Disciplines and the German Government V-Modell	107
7.3	Configurations in the Context of Requirements Management	108
7.3.1	Changes of requirements and specifications in practice.....	109
7.3.2	Requirements Management – Configuration Units	112
7.4	Traceability in Requirement Management and Configuration Management.....	114
7.5	Tool Use for Version and Configuration Management	115
7.5.1	Solution Concept:Traceability in Practice	116
7.6	Summary	117
8	Metrics and Analysis.....	121
8.1	Metrics – general	121
8.2	The Importance of Metrics	122
8.3	Attributes of Metrics	123
8.3.1	Goals Supported by the Metric	123
8.3.2	Customers of the Metric	124
8.3.3	Interval of Measurement	124
8.3.4	Measurements Used	124
8.3.5	Unit of Measurement.....	124
8.3.6	Data Source (Effort required to capture /reliability).....	124
8.3.7	Interpretation of Results	125
8.3.8	Strengths and Weaknesses of the Metric	125
8.3.9	Prerequisites for Measurement.....	125
8.3.10	Presentation Format for the Metric	125
8.4	Typical Improvement Goals with RM&E	126
8.4.1	Reduction in Change Costs	126
8.4.2	Reaching CMMI Level 3 in an Assessment	127
8.4.3	Reaching a Specific SPICE Level in an Assessment	127
8.4.4	Introducing and Establishing RM&E Methodology in Pilot Projects	128
8.4.5	Creating Basic Know-How in RM&E Amongst Employees	128
8.4.6	Improving the Quality of an RM&E Process.....	128
8.4.7	Improving Customer and Supplier Specifications	129
8.5	Example of a Metric	130
8.5.1	Creating a basic level of know-how in RM&E amongst staff.....	130
8.6	The Evaluation of a Metric by Management	132

8.7	Psychological Aspects of Introducing RM&E Metrics.....	133
8.8	Summary.....	135
9	Risk Management interface.....	137
9.1	What is a risk	137
9.2	What is Risk Management.....	138
9.3	Preparing a Risk Management.....	138
9.4	The Risk Management process.....	141
9.4.1	Risk identification and how Requirements Management can support.....	142
9.4.2	Risk assessment and how Requirements Management can support	148
9.4.3	Definition of countermeasures and how Requirements Management can support	151
9.4.4	Monitoring risks and how Requirements Management can support	153
9.5	Summary	154
10	Test Management (Validation and Verification) interface	157
10.1	What are Validation and Verification?.....	157
10.2	The Validation and Verification planning process.....	158
10.3	The role of Requirements Management in Validation and Verification	160
10.3.1	Requirements Management supports in defining the test scope	160
10.3.2	Requirements Management supports in documenting the test method	164
10.3.3	Requirements Management supports in documenting who carries out the verification	166
10.3.4	Requirements Management supports in defining when to carry out verifications	168
10.3.5	Requirements Management supports in estimating the costs of verification	171
10.3.6	Requirements Management supports in estimating the effort needed for verification	172
10.4	Summary	173
11	Change Management interface	175
11.1	General.....	175
11.2	Basics of Change Management	175
11.3	Factors Influencing Change.....	176
11.4	Number of Changes during Development.....	177
11.5	Two Phases of Change Management: Informing and Approval-based	178
11.5.1	Informing Change Management.....	179
11.5.2	Approving Change Management.....	180
11.6	Turning Change Management theory into practice.....	186
11.6.1	Effects of a Lack of Change Management	187
11.6.2	Management support for introducing processes.....	188
11.7	Procedure for Introducing Structured Change Management	189
11.8	Summary	191
12	Advanced Requirements Management: the complete specification.....	193
12.1	Interfaces between other Systems Engineering disciplines and Requirements	193
12.2	Getting away from the document view	195
12.2.1	The document view.....	195
12.2.2	The information view	196
12.3	Implementing Requirements Management	198
12.3.1	Implementing the interface to Project Management and Quality Management	200
12.3.2	Implementing the interface to Version Management and Configuration Management.....	203
12.3.3	Implementing the interface to Risk Management	207
12.3.4	Implementing the interface to Test Management.....	208
12.3.5	Implementing the interface to Change Management	209
12.3.6	Overview.....	212
12.4	Summary	213

13	The HOOD Capability Models	215
13.1	The meaning of capability models	215
13.2	Why we need capability models	216
13.3	Two example capability models	218
13.3.1	SPICE	218
13.3.2	CMMI	220
13.4	HOOD Capability Model for Requirements Definition	221
13.5	HOOD Capability Model for Requirements Management.....	222
13.6	Summary	222
14	The HOOD Capability Model for Requirements Definition	223
14.1	Brief repetition of the HOOD Requirements Definition Process	223
14.2	The idea behind the HOOD capability model for requirements definition	224
14.3	The structure of the HOOD capability model for requirements definition	226
14.4	How to use the HOOD capability model for requirements definition	228
14.4.1	Level 1: Getting started	228
14.4.2	Level 2: Capable.....	236
14.4.3	Level 3: Expert	239
14.5	Summary	242
15	The HOOD Capability Model for Requirements Management.....	243
15.1	The structure of the HOOD capability model for requirements management	243
15.2	How to use the HOOD capability model for requirements management.....	244
15.2.1	Level 1: Getting started	245
15.2.2	Level 2: Capable.....	252
15.2.3	Level 3: Expert	259
15.3	Summary	265
List of References		267
Index		273