Contents

1 Software Project Management: Setting the Context 1
1.1 Motivation 1
1.2 Characteristics of Software Projects and Why Software Project Management Is Difficult 3
1.3 Ten Knowledge Areas of Software Project Management 6
1.4 The Book's Coverage of the PMBOK Knowledge Areas 16
1.5 The Multidisciplinary Nature of Project Management 18
1.6 The Future of Software Engineering 19
1.7 Software Project Management: Past and Future 20
1.8 This Book 21
References 23

Part I Fundamentals

2 Rethinking Success in Software Projects: Looking Beyond the Failure Factors 27
2.1 The Extent of Software Project Failures 27
2.2 Beyond Simple Success Measures 31
2.3 Rethinking Project Success 34
2.4 Towards Multiple Levels of Success 36
2.5 Mapping Success 37
2.6 Illustrative Examples 40
2.7 The Impact of Time 41
2.8 Measuring Success 42
2.9 Conclusions 46
References 47

3 Cost Prediction and Software Project Management 51
3.1 Introduction 51
3.2 A Review of State-of-the-Art Techniques 52
3.3 A Review of Cost Estimation Research 55

Bibliografische Informationen
http://d-nb.info/1048739325

digitalisiert durch DEUTSCHE NATIONAL BIBLIOTHEK

3.4 The Interaction Between People and Formal Techniques 58
3.5 Practical Recommendations 63
3.6 Follow-Up Sources of Information 65
Glossary 66
References 68

4 Human Resource Allocation and Scheduling for Software Project Management 73
4.1 Introduction 74
4.2 Human Resource Allocation and Scheduling Approaches 76
4.3 The Implication of Software Development Personality Types . . . 92
4.4 Further Research Trends and Challenges 100
4.5 Concluding Remarks 101
References 102

5 Software Project Risk and Opportunity Management 107
5.1 Introduction 107
5.2 The Duality of Risks and Opportunities 108
5.3 Fundamentals of Risk–Opportunity Management 109
5.4 Risk and Opportunity Management Methods, Processes, and Tools 115
5.5 Top-10 Risk Item Tracking 117
5.6 Risk-Balanced Activity Levels 119
5.7 Summary and Conclusions 120
References 120

Part II Supporting Areas

6 Model-Based Quality Management of Software Development Projects 125
6.1 Introduction 126
6.2 Selecting the Right Quality Models 129
6.3 Building Custom-Tailored Quality Models 136
6.4 Specification and Application of Quality Models 145
6.5 Strategic Usage of Quality Models 150
6.6 Conclusions and Future Work 153
References 154

7 Supporting Project Management Through Integrated Management of System and Project Knowledge 157
7.1 Introduction 158
7.2 Our Vision: Integrated System and Project Knowledge Management 161
7.3 Literature Review 165
7.4 Integrating System and Project Knowledge Using Work Items . . . 168

7.5 Integrating System and Project Knowledge Using Decisions . . . 175
7.6 Research Issues on Integrating System and Project Knowledge . . . 185
7.7 Conclusions and Outlook . . . 187
References . . . 188

8 Framework for Implementing Product Portfolio Management in Software Business . . . 193
8.1 Introduction . . . 194
8.2 Research Approach . . . 196
8.3 Theory-Building Case Study and Evaluation . . . 201
8.4 Software Product Portfolio Management Implementation Framework . . . 204
8.5 Maturity Matrix for PPM . . . 211
8.6 Theory-Testing Case Study . . . 214
8.7 Implications . . . 217
8.8 Conclusions and Future Research . . . 218
References . . . 219

9 Managing Global Software Projects . . . 223
9.1 Introduction . . . 224
9.2 Foundations . . . 225
9.3 Benefits and Challenges . . . 226
9.4 Global Software Development . . . 232
9.5 Work Organization . . . 235
9.6 Risk Management in Global Software Projects . . . 239
9.7 Trends and Conclusions . . . 243
References . . . 245

10 Motivating Software Engineers Working in Virtual Teams Across the Globe . . . 247
10.1 Introduction . . . 248
10.2 Motivation Theory . . . 249
10.3 Characteristics of a Software Engineer . . . 254
10.4 Software Engineer Motivation in GSD—A Case Study . . . 256
10.5 Motivational Factors and GSD Guidelines . . . 262
10.6 Theory and Practice of GSD Motivation . . . 262
10.7 Summary and Conclusions . . . 269
References . . . 271

Part III New Paradigms

11 Agile Project Management . . . 277
11.1 Introduction . . . 277
11.2 Software Project Management . . . 278
11.3 Self-Managing Software Teams . . . 282
11.4 Team Leadership . . . 284

11.5 Feedback and Learning 287
11.6 Principles of Agile Project Management 292
11.7 Conclusions 296
References 296

12 Distributed Project Management 301
12.1 Introduction 301
12.2 Ten Misconceptions in Distributed Software Development 305
12.3 Conclusions 318
References 319

13 Management and Coordination of Free/Open Source Projects 321
13.1 Introduction 322
13.2 F/OSS Management 327
13.3 Current Challenges in F/OSS Management 332
13.4 Future Open Source Management Techniques 335
13.5 Conclusions 340
References 340

14 Inner Source Project Management 343
14.1 Introduction 344
14.2 Inner Source 345
14.3 A Framework for Understanding Project Management in Inner Source 352
14.4 Case Studies 357
14.5 Discussion and Future Work 365
References 367

Part IV Emerging Techniques

15 Search-Based Software Project Management 373
15.1 Introduction 373
15.2 Search-Based Software Engineering 375
15.3 Search-Based Software Project Management 376
15.4 Possible Directions for Future Work on Search-Based Project Management 388
15.5 Conclusions 392
References 392

16 Social Media Collaboration in Software Projects 401
16.1 Introduction 401
16.2 Interactions in Software Projects 403
16.3 Social Aspects of Software Projects 404
16.4 Importance of Social Media in Software Projects 405
16.5 Pilot Study 405
16.6 The Future of Social Media in Software Projects 420

16.7 Conclusions 422
References 422

17 Process Simulation: A Tool for Software Project Managers? 425
17.1 Purpose and Scope of Software Process Simulation 426
17.2 An Illustrative Application Example 428
17.3 The Gap Between State of the Art and State of Practice 438
17.4 Issues that need to be Addressed 441
17.5 Conclusions 444
References 445

18 Occam's Razor and Simple Software Project Management 447
18.1 Introduction 447
18.2 Occam's Razor and Project Management 450
18.3 Speculation-Based Modeling (Is Difficult) 452
18.4 Support-Based Modeling (Can Be Simplified with Data Mining) . . . 454
18.5 Spectral Learning and Project Management 461
18.6 General Applications to Project Management 469
18.7 Discussion 470
References 471

Index 473