# Contents.

Preface xxiii

# 1 OVERVIEW 1

- 1.0 Introduction 1
- 1.1 Understanding Project Management 2
- 1.2 Defining Project Success 7
- 1.3 Success, Trade-Offs, and Competing Constraints 8
- 1.4 The Project Manager–Line Manager Interface 9
- 1.5 Defining the Project Manager's Role 14
- 1.6 Defining the Functional Manager's Role 15
- 1.7 Defining the Functional Employee's Role 18
- 1.8 Defining the Executive's Role 19
- 1.9 Working with Executives 19
- 1.10 Committee Sponsorship/Governance 20
- 1.11 The Project Manager as the Planning Agent 23
- 1.12 Project Champions 24
- 1.13 The Downside of Project Management 25
- 1.14 Project-Driven versus Non–Project-Driven Organizations 25
- 1.15 Marketing in the Project-Driven Organization 28
- 1.16 Classification of Projects 30
- 1.17 Location of the Project Manager 30
- 1.18 Differing Views of Project Management 32
- 1.19 Public-Sector Project Management 34
- 1.20 International Project Management 38
- 1.21 Concurrent Engineering: A Project Management Approach 38
- 1.22 Added Value 39
- 1.23 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 40

Problems 42

## Case Study

Williams Machine Tool Company 44

# 2 PROJECT MANAGEMENT GROWTH: CONCEPTS AND DEFINITIONS 47

- 2.0 Introduction 47
- 2.1 General Systems Management 48
- 2.2 Project Management: 1945–1960 48
- 2.3 Project Management: 1960–1985 49
- 2.4 Project Management: 1985–2012 55
- 2.5 Resistance to Change 59
- 2.6 Systems, Programs, and Projects: A Definition 64
- 2.7 Product versus Project Management: A Definition 66
- 2.8 Maturity and Excellence: A Definition 68
- 2.9 Informal Project Management: A Definition 69
- 2.10 The Many Faces of Success 70
- 2.11 The Many Faces of Failure 73
- 2.12 The Stage-Gate Process 76
- 2.13 Project Life Cycles 78
- 2.14 Gate Review Meetings (Project Closure) 83
- 2.15 Engagement Project Management 84
- 2.16 Project Management Methodologies: A Definition 85
- 2.17 Enterprise Project Management Methodologies 87
- 2.18 Methodologies Can Fail 91
- 2.19 Organizational Change Management and Corporate Cultures 94
- 2.20 Project Management Intellectual Property 100
- 2.21 Systems Thinking 101
- 2.22 Studying Tips for the PMI® Project Management Certification Exam 104

Problems 107

# Case Study

Creating a Methodology 108

# 3 ORGANIZATIONAL STRUCTURES 111

- 3.0 Introduction 111
- 3.1 Organizational Work Flow 113
- 3.2 Traditional (Classical) Organization 114
- 3.3 Developing Work Integration Positions 117
- 3.4 Line-Staff Organization (Project Coordinator) 121
- 3.5 Pure Product (Projectized) Organization 122
- 3.6 Matrix Organizational Form 125
- 3.7 Modification of Matrix Structures 132
- 3.8 The Strong, Weak, or Balanced Matrix 136
- 3.9 Center for Project Management Expertise 136
- 3.10 Matrix Layering 137

- 3.11 Selecting the Organizational Form 138
- 3.12 Structuring the Small Company 143
- 3.13 Strategic Business Unit (SBU) Project Management 146
- 3.14 Transitional Management 147
- 3.15 Barriers to Implementing Project Management in Emerging Markets 149
- 3.16 Seven Fallacies that Delay Project Management Maturity 156
- 3.17 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 159

## Case Studies

Jones and Shephard Accountants, Inc. 166 Coronado Communications 168

# 4 ORGANIZING AND STAFFING THE PROJECT OFFICE AND TEAM 171

- 4.0 Introduction 171
- 4.1 The Staffing Environment 172
- 4.2 Selecting the Project Manager: An Executive Decision 174
- 4.3 Skill Requirements for Project and Program Managers 178
- 4.4 Special Cases in Project Manager Selection 184
- 4.5 Selecting the Wrong Project Manager 184
- 4.6 Next Generation Project Managers 188
- 4.7 Duties and Job Descriptions 189
- 4.8 The Organizational Staffing Process 193
- 4.9 The Project Office 199
- 4.10 The Functional Team 204
- 4.11 The Project Organizational Chart 205
- 4.12 Special Problems 208
- 4.13 Selecting the Project Management Implementation Team 210
- 4.14 Mistakes Made by Inexperienced Project Managers 213
- 4.15 Studying Tips for the PMI® Project Management Certification Exam 214

Problems 216

# 5 MANAGEMENT FUNCTIONS 223

- 5.0 Introduction 223
- 5.1 Controlling 225
- 5.2 Directing 225
- 5.3 Project Authority 230
- 5.4 Interpersonal Influences 237
- 5.5 Barriers to Project Team Development 240
- 5.6 Suggestions for Handling the Newly Formed Team 243

- 5.7 Team Building as an Ongoing Process 246
- 5.8 Dysfunctions of a Team 247
- 5.9 Leadership in a Project Environment 250
- 5.10 Life-Cycle Leadership 252
- 5.11 Value-Based Project Leadership 255
- 5.12 Organizational Impact 257
- 5.13 Employee–Manager Problems 259
- 5.14 Management Pitfalls 262
- 5.15 Communications 265
- 5.16 Project Review Meetings 274
- 5.17 Project Management Bottlenecks 275
- 5.18 Cross-Cutting Skills 276
- 5.19 Active Listening 277
- 5.20 Project Problem-Solving 278
- 5.21 Brainstorming 288
- 5.22 Project Decision-Making 293
- 5.23 Predicting the Outcome of a Decision 301
- 5.24 Facilitation 303
- 5.25 Handling Negative Team Dynamics 306
- 5.26 Communication Traps 307
- 5.27 Proverbs and Laws 309
- 5.28 Human Behavior Education 311
- 5.29 Management Policies and Procedures 312
- 5.30 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 313

#### Case Studies

The Trophy Project 327 Communication Failures 329 McRoy Aerospace 332 The Poor Worker 333 The Prima Donna 334 The Team Meeting 335 Leadership Effectiveness (A) 337 Leadership Effectiveness (B) 341 Motivational Questionnaire 347

#### 6 MANAGEMENT OF YOUR TIME AND STRESS 355

- 6.0 Introduction 355
- 6.1 Understanding Time Management 356
- 6.2 Time Robbers 356
- 6.3 Time Management Forms 358

- 6.4 Effective Time Management 359
- 6.5 Stress and Burnout 360
- 6.6 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 362

#### **Case Study**

The Reluctant Workers 364

# 7 CONFLICTS 365

- 7.0 Introduction 365
- 7.1 Objectives 366
- 7.2 The Conflict Environment 367
- 7.3 Types of Conflicts 368
- 7.4 Conflict Resolution 371
- 7.5 Understanding Superior, Subordinate, and Functional Conflicts 372
- 7.6 The Management of Conflicts 374
- 7.7 Conflict Resolution Modes 375
- 7.8 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 377

Problems 379

# **Case Studies**

Facilities Scheduling at Mayer Manufacturing382Telestar International383Handling Conflict in Project Management384

## 8 SPECIAL TOPICS 391

- 8.0 Introduction 392
- 8.1 Performance Measurement 392
- 8.2 Financial Compensation and Rewards 399
- 8.3 Critical Issues with Rewarding Project Teams 405
- 8.4 Effective Project Management in the Small Business Organization 408
- 8.5 Mega Projects 410
- 8.6 Morality, Ethics, and the Corporate Culture 411
- 8.7 Professional Responsibilities 414
- 8.8 Internal Partnerships 417
- 8.9 External Partnerships 418
- 8.10 Training and Education 420
- 8.11 Integrated Product/Project Teams 422
- 8.12 Virtual Project Teams 424
- 8.13 Breakthrough Projects 427

- 8.14 Managing Innovation Projects 427
- 8.15 Agile Project Management 430

8.16 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 431

Problems 437

## **Case Study**

Is It Fraud? 440

# 9 THE VARIABLES FOR SUCCESS 443

- 9.0 Introduction 443
- 9.1 Predicting Project Success 444
- 9.2 Project Management Effectiveness 448
- 9.3 Expectations 449
- 9.4 Lessons Learned 450
- 9.5 Understanding Best Practices 451
- 9.6 Best Practices versus Proven Practices 458
- 9.7 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 459

Problems 460

# **Case Study**

Radiance International 460

# 10 WORKING WITH EXECUTIVES 463

- 10.0 Introduction 463
- 10.1 The Project Sponsor 464
- 10.2 Handling Disagreements with the Sponsor 474
- 10.3 The Collective Belief 475
- 10.4 The Exit Champion 476
- 10.5 The In-House Representatives 477
- 10.6 Stakeholder Relations Management 478
- 10.7 Politics 486
- 10.8 Studying Tips for the PMI® Project Management Certification Exam 487

Problems 488

## **Case Studies**

Corwin Corporation 491 The Prioritization of Projects 499 The Irresponsible Sponsors 500 Selling Executives on Project Management 502

#### 11 PLANNING 505

11.0 Introduction 505

11.1 Validating the Assumptions 508

11.2 Validating the Objectives 509

11.3 General Planning 510

11.4 Life-Cycle Phases 513

11.5 Proposal Preparation 516

11.6 Kickoff Meetings 516

11.7 Understanding Participants' Roles 519

11.8 Project Planning 519

11.9 The Statement of Work 521

11.10 Project Specifications 526

11.11 Milestone Schedules 528

11.12 Work Breakdown Structure 529

11.13 WBS Decomposition Problems 536

11.14 Work Breakdown Structure Dictionary 540

11.15 Role of the Executive in Project Selection 541

11.16 Role of the Executive in Planning 546

11.17 The Planning Cycle 546

11.17 Work Planning Authorization 547

11.19 Why Do Plans Fail? 548

11.20 Stopping Projects 549

11.21 Handling Project Phaseouts and Transfers 550

11.22 Detailed Schedules and Charts 551

11.23 Master Production Scheduling 554

11.24 Project Plan 556

11.25 Total Project Planning 561

11.26 The Project Charter 565

11.27 Project Baselines 566

11.28 Verification and Validation 570

11.29 Requirements Traceability Matrix 571

11.30 Management Control 572

11.31 The Project Manager–Line Manager Interface 575

11.32 Fast-Tracking 577

11.33 Configuration Management 578

11.34 Enterprise Project Management Methodologies 579

11.35 Project Audits 582

11.36 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 583

Problems 586

#### 12 NETWORK SCHEDULING TECHNIQUES 597

12.0 Introduction 597

12.1 Network Fundamentals 600

- 12.2 Graphical Evaluation and Review Technique (GERT) 604
- 12.3 Dependencies 605
- 12.4 Slack Time 606
- 12.5 Network Replanning 612
- 12.6 Estimating Activity Time 616
- 12.7 Estimating Total Project Time 617
- 12.8 Total PERT/CPM Planning 618
- 12.9 Crash Times 620
- 12.10 PERT/CPM Problem Areas 623
- 12.11 Alternative PERT/CPM Models 626
- 12.12 Precedence Networks 627
- 12.13 Lag 630
- 12.14 Scheduling Problems 632
- 12.15 The Myths of Schedule Compression 632
- 12.16 Understanding Project Management Software 634
- 12.17 Software Features Offered 634
- 12.18 Software Classification 636
- 12.19 Implementation Problems 637
- 12.20 Critical Chain 638
- 12.21 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 640

# **Case Studies**

Crosby Manufacturing Corporation 656 The Invisible Sponsor 658

# 13 PROJECT GRAPHICS 661

- 13.0 Introduction 661
- 13.1 Customer Reporting 662
- 13.2 Bar (Gantt) Chart 663
- 13.3 Other Conventional Presentation Techniques 670
- 13.4 Logic Diagrams/Networks 673
- 13.5 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 674

Problems 675

# 14 PRICING AND ESTIMATING 677

- 14.0 Introduction 677
- 14.1 Global Pricing Strategies 678
- 14.2 Types of Estimates 679
- 14.3 Pricing Process 682
- 14.4 Organizational Input Requirements 684
- 14.5 Labor Distributions 686

14.6 Overhead Rates 690

14.7 Materials/Support Costs 692

14.8 Pricing Out the Work 695

14.9 Smoothing Out Department Man-Hours 696

14.10 The Pricing Review Procedure 698

14.11 Systems Pricing 700

14.12 Developing the Supporting/Backup Costs 701

14.13 The Low-Bidder Dilemma 705

14.14 Special Problems 705

14.15 Estimating Pitfalls 706

14.16 Estimating High-Risk Projects 707

14.17 Project Risks 708

14.18 The Disaster of Applying the 10 Percent Solution to Project Estimates 712

14.19 Life-Cycle Costing (LCC) 714

14.20 Logistics Support 719

14.21 Economic Project Selection Criteria: Capital Budgeting 720

14.22 Payback Period 720

14.23 The Time Value of Money 721

14.24 Net Present Value (NPV) 722

14.25 Internal Rate of Return (IRR) 723

14.26 Comparing IRR, NPV, and Payback 724

14.27 Risk Analysis 724

14.28 Capital Rationing 725

14.29 Project Financing 726

14.30 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 728

Problems 730

#### Case Study

The Estimating Problem 734

#### 15 COST CONTROL 737

15.0 Introduction 737

15.1 Understanding Control 741

15.2 The Operating Cycle 744

15.3 Cost Account Codes 745

15.4 Budgets 750

15.5 The Earned Value Measurement System (EVMS) 752

15.6 Variance and Earned Value 754

15.7 The Cost Baseline 773

15.8 Justifying the Costs 775

15.9 The Cost Overrun Dilemma 778

15.10 Recording Material Costs Using Earned Value Measurement 779

15.11 The Material Accounting Criterion 782

- 15.12 Material Variances: Price and Usage 783
- 15.13 Summary Variances 784
- 15.14 Status Reporting 785
- 15.15 Cost Control Problems 792
- 15.16 Project Management Information Systems 793
- 15.17 Enterprise Resource Planning 793
- 15.18 Project Metrics 794
- 15.19 Key Performance Indicators 800
- 15.20 Value-Based Metrics 806
- 15.21 Dashboards and Scorecards 812
- 15.22 Business Intelligence 815
- 15.23 Infographics 816
- 15.24 Studying Tips for the PMI® Project Management Certification Exam 816

## **Case Studies**

The Bathtub Period838Franklin Electronics839Trouble in Paradise841

#### 16 TRADE-OFF ANALYSIS IN A PROJECT ENVIRONMENT 845

- 16.0 Introduction 845
- 16.1 Methodology for Trade-Off Analysis 848
- 16.2 Contracts: Their Influence on Projects 865
- 16.3 Industry Trade-Off Preferences 866
- 16.4 Conclusion 869
- 16.5 Studying Tips for the PMI<sup>®</sup> Project Management Certification Exam 869

#### 17 RISK MANAGEMENT 871

- 17.0 Introduction 872
- 17.1 Definition of Risk 873
- 17.2 Tolerance for Risk 875
- 17.3 Definition of Risk Management 876
- 17.4 Certainty, Risk, and Uncertainty 877
- 17.5 Risk Management Process 883
- 17.6 Plan Risk Management (11.1) 884
- 17.7 Risk Identification (11.2) 885
- 17.8 Risk Analysis (11.3, 11.4) 892
- 17.9 Qualitative Risk Analysis (11.3) 897
- 17.10 Quantitative Risk Analysis (11.4) 903
- 17.11 Probability Distributions and the Monte Carlo Process 904
- 17.12 Plan Risk Response (11.5) 913

- 17.13 Monitor and Control Risks (11.6) 919
- 17.14 Some Implementation Considerations 920
- 17.15 The Use of Lessons Learned 921
- 17.16 Dependencies Between Risks 925
- 17.17 The Impact of Risk Handling Measures 930
- 17.18 Risk and Concurrent Engineering 933

17.19 Studying Tips for the PMI® Project Management Certification Exam 936

Problems 940

# **Case Studies**

Teloxy Engineering (A) 948 Teloxy Engineering (B) 948 The Risk Management Department 949

# 18 LEARNING CURVES 953

- 18.0 Introduction 953
- 18.1 General Theory 954
- 18.2 The Learning Curve Concept 954
- 18.3 Graphic Representation 956
- 18.4 Key Words Associated with Learning Curves 958
- 18.5 The Cumulative Average Curve 958
- 18.6 Sources of Experience 960
- 18.7 Developing Slope Measures 963
- 18.8 Unit Costs and Use of Midpoints 964
- 18.9 Selection of Learning Curves 965
- 18.10 Follow-On Orders 966
- 18.11 Manufacturing Breaks 966
- 18.12 Learning Curve Limitations 968
- 18.13 Prices and Experience 968
- 18.14 Competitive Weapon 970
- 18.15 Studying Tips for the PMI® Project Management Certification Exam 971

Problems 972

# 19 CONTRACT MANAGEMENT 975

- 19.0 Introduction 975
- 19.1 Procurement 976
- 19.2 Plan Procurements 978
- 19.3 Conducting the Procurements 981
- 19.4 Conduct Procurements: Request Seller Responses 983
- 19.5 Conduct Procurements: Select Sellers 983
- 19.6 Types of Contracts 987
- 19.7 Incentive Contracts 991
- 19.8 Contract Type versus Risk 994

- 19.9 Contract Administration 995
- 19.10 Contract Closure 998
- 19.11 Using a Checklist 999
- 19.12 Proposal-Contractual Interaction 1000

19.13 Summary 1003

19.14 Studying Tips for the PMI® Project Management Certification Exam 1004

# **Case Studies**

The Scheduling Dilemma1009To Bid or Not to Bid1011The Management Reserve1012

# 20 QUALITY MANAGEMENT 1015

- 20.0 Introduction 1016
- 20.1 Definition of Quality 1017
- 20.2 The Quality Movement 1019
- 20.3 Comparison of the Quality Pioneers 1022
- 20.4 The Taguchi Approach 1023
- 20.5 The Malcolm Baldrige National Quality Award 1026
- 20.6 ISO 9000 1027
- 20.7 Quality Management Concepts 1029
- 20.8 The Cost of Quality 1032
- 20.9 The Seven Quality Control Tools 1035
- 20.10 Process Capability  $(C_P)$  1052
- 20.11 Acceptance Sampling 1054
- 20.12 Implementing Six Sigma 1054
- 20.13 Lean Six Sigma and DMAIC 1056
- 20.14 Quality Leadership 1057
- 20.15 Responsibility for Quality 1058
- 20.16 Quality Circles 1058
- 20.17 Just-In-Time Manufacturing (JIT) 1059
- 20.18 Total Quality Management (TQM) 1061
- 20.19 Studying Tips for the PMI® Project Management Certification Exam 1065

## 21 MODERN DEVELOPMENTS IN PROJECT MANAGEMENT 1069

- 21.0 Introduction 1069
- 21.1 The Project Management Maturity Model (PMMM) 1070
- 21.2 Developing Effective Procedural Documentation 1074
- 21.3 Project Management Methodologies 1078
- 21.4 Continuous Improvement 1079
- 21.5 Capacity Planning 1080
- 21.6 Competency Models 1082
- 21.7 Managing Multiple Projects 1084
- 21.8 End-of-Phase Review Meetings 1085

# **Case Study**

Honicker Corporation 1086

## 22 THE BUSINESS OF SCOPE CHANGES 1089

- 22.0 Introduction 1089
- 22.1 Need for Business Knowledge 1091
- 22.2 Timing of Scope Changes 1092
- 22.3 Business Need for a Scope Change 1093
- 22.4 Rationale for Not Approving a Scope Change 1094

## Case Study

Kemko Manufacturing 1094

## 23 THE PROJECT OFFICE 1097

- 23.0 Introduction 1097
- 23.1 Present-Day Project Office 1098
- 23.2 Implementation Risks 1099
- 23.3 Types of Project Offices 1100
- 23.4 Networking Project Management Offices 1101
- 23.5 Project Management Information Systems 1101
- 23.6 Dissemination of Information 1103
- 23.7 Mentoring 1104
- 23.8 Development of Standards and Templates 1105
- 23.9 Project Management Benchmarking 1105
- 23.10 Business Case Development 1106
- 23.11 Customized Training (Related to Project Management) 1107
- 23.12 Managing Stakeholder Relations 1108
- 23.13 Continuous Improvement 1109
- 23.14 Capacity Planning 1109
- 23.15 Risks of Using a Project Office 1110
- 23.16 Project Portfolio Management 1111

#### Case Study

The Project Management Lawsuit 1116

## 24 MANAGING CRISIS PROJECTS 1119

- 24.0 Introduction 1119
- 24.1 Understanding Crisis Management 1119
- 24.2 Ford versus Firestone 1121
- 24.3 The Air France Concorde Crash 1122
- 24.4 Intel and the Pentium Chip 1123
- 24.5 The Russian Submarine Kursk 1123
- 24.6 The Tylenol Poisonings 1124

- 24.7 Nestlé's Marketing of Infant Formula 1127
- 24.8 The Space Shuttle Challenger Disaster 1129
- 24.9 The Space Shuttle Columbia Disaster 1130
- 24.10 Victims Versus Villains 1131

24.11 Life-Cycle Phases 1132

24.12 Project Management Implications 1133

# 25 FUTURE OF PROJECT MANAGEMENT 1135

- 25.0 Changing Times 1135
- 25.1 Complex Projects 1139
- 25.2 Complexity Theory 1144
- 25.3 Scope Creep 1145
- 25.4 Project Health Checks 1151
- 25.5 Managing Troubled Projects 1155

# 26 THE RISE, FALL, AND RESURRECTION OF IRIDIUM: A PROJECT MANAGEMENT PERSPECTIVE 1167

- 26.0 Introduction 1167
- 26.1 Naming the Project "Iridium" 1169
- 26.2 Obtaining Executive Support 1170
- 26.3 Launching the Venture 1170
- 26.4 The Iridium System 1172
- 26.5 The Terrestrial and Space-Based Network 1172
- 26.6 Project Initiation: Developing the Business Case 1173
- 26.7 The "Hidden" Business Case 1175
- 26.8 Risk Management 1175
- 26.9 The Collective Belief 1177
- 26.10 The Exit Champion 1177
- 26.11 Iridium's Infancy Years 1178
- 26.12 Debt Financing 1181
- 26.13 The M-Star Project 1182
- 26.14 A New CEO 1183
- 26.15 Satellite Launches 1183
- 26.16 An Initial Public Offering (IPO) 1184
- 26.17 Signing Up Customers 1184
- 26.18 Iridium's Rapid Ascent 1185
- 26.19 Iridium's Rapid Descent 1187
- 26.20 The Iridium "Flu" 1191
- 26.21 Searching for a White Knight 1192
- 26.22 The Definition of Failure (October, 1999). 1192
- 26.23 The Satellite Deorbiting Plan 1193
- 26.24 Iridium is Rescued for \$25 Million 1194
- 26.25 Iridium Begins to Grow 1194

26.26 Shareholder Lawsuits 1195

26.27 The Bankruptcy Court Ruling 1195

26.28 Autopsy 1196

26.29 Financial Impact of the Bankruptcy 1197

26.30 What Really Went Wrong? 1198

26.31 Lessons Learned 1200

26.32 Conclusion 1202

Appendix A. Solutions to the Project Management Conflict Exercise 1205

Appendix B. Solution to Leadership Exercise 1211

Appendix C. Dorale Products Case Studies 1217

Appendix D. Solutions to the Dorale Products Case Studies 1229

Appendix E. Alignment of the PMBOK<sup>®</sup> Guide to the Text 1235

Author Index 1241

Subject Index 1243