
Contents

List of Illustrations xi

List of Tables xv

Foreword xvii

Introduction xxiii

1 The Information Age 1

 The Old Software Ghosts That Haunt Us 2

2 Managing Requirements 7

 Ensure System Requirements Have Been Reviewed
 by Software Professionals before Forging Ahead 8

 Establish and Enforce a Directive Stating What Must Be Done
 when Dealing with System Requirements 9

 Train Those Who Have the Responsibility
 of Managing Requirements 10

 Document Project Requirements and Make Them Available
 to Project Team Members 11

 Take Basic Measurements of Requirements Management Activities
 and By-Products 12

 Involve Quality Assurance Personnel
 when Managing Requirements 13

 Conduct Reviews of Requirements Management Activities and
 By-Products 15

3 Planning 17

 Involve Software Professionals when the Project Is in Its Early
 Conceptual Stage 17

 Insist That a Plan Be Prepared and Specify What It Should Contain 18

 Ensure the WBS Is Used Properly 19

 Start by Estimating Size 20

 Ensure That Auxiliary Resources Have Been Factored into the Plans 23

Identify, Evaluate, and Document Risks	25
Ensure Management Reviews Commitments Made to Suppliers and Customers	26
Establish and Enforce a Directive Stating What Must Be Performed in the Course of Planning a Project.....	27
Train Those Who Must Plan the Project.....	27
Ensure That Individuals and Groups Are Informed of Project Commitments That Affect Them.....	28
Involve Quality Assurance Personnel during Project Planning	29
Ensure That Management Reviews Project Planning Activities and By-Products.....	29
4 Tracking Progress	31
Ensure Management Reviews Changes to Commitments Made to Suppliers and Customers	32
Ensure That Individuals and Groups Are Informed of Changes to Project Commitments That Affect Them	32
Ensure That Internal Project Reviews Are Held to Track Progress.....	33
Track Risks	36
Institutionalize Formal Reviews	37
Take Measurements	38
Establish Clear Roles and Responsibilities.....	40
Establish Quality Assurance to Help Monitor Project Tracking and Supervision	40
State What Is Expected at the Organizational Level in Terms of Project Monitoring.....	41
5 Assuring Quality	43
Establish a Quality Policy.....	44
Assign the Responsibility of Assuring Quality.....	45
Train Personnel Assigned to Assuring Quality.....	46
Prepare and Implement a Quality Assurance Plan.....	47
Document Non-Compliant Items.....	49
Communicate Quality Assurance Activities and Results	51
Have Quality Representatives Interface with Customers.....	51
Institute Senior Management Reviews of Quality Assurance Activities.....	52
6 Releasing Products, Deploying Services, and Controlling Changes	55
Establish a Repository for Baselines	56
Identify What Items Will Be Placed under Formal Change Control.....	57
Assign Release and Change Control to Someone.....	57
Have a Plan for Controlling Deliverables and Essential Work Products	58
Document Change Requests and Problem Reports	59
Control Changes Affecting Baselines	60
Document What the Release and Change Control Repository Contains	61

Conduct Baseline Audits	61
Specify What Is Minimally Acceptable in Terms of Release and Change Control	62
7 Contracting Out	65
Establish and Enforce a Directive Describing at a High Level the Steps to Take for Contracting Work Out	66
Insist on Having the Supplier Submit a Plan	67
Agree with the Supplier on How Progress Will Be Tracked and How Contractual Changes Will Be Made	69
Hold Progress and Coordination Reviews with Suppliers	70
Conduct Periodic Formal Reviews with Suppliers	71
Involve Quality Assurance Personnel and Personnel Responsible for Release and Change Control	71
Ensure That Acceptance Tests of Suppliers' Deliverables Are Performed, Complete, and Documented	73
Train Those Responsible for the Selection and Management of Suppliers	73
8 Developing Products	75
Define the Format That Work Products Must Follow	76
Ensure That Appropriate Methods and Tools Are Available	77
State What Is Expected in Terms of Adherence to Development Processes	78
Take the Time to Train Members of the Technical Staff on How to Perform Their Tasks	78
Ensure That Comprehensive Software Requirements Have Been Developed before Moving On	80
Develop Operational and User Documentation Early On	81
Plan Testing Activities and Test Thoroughly	82
Collect and Analyze Defects	83
Measure, Measure, and Measure, But with Circumspection	84
Involve Quality Assurance Personnel Throughout	85
Periodically Review Development Activities and Results	86
9 Coordinating	89
Document Stakeholders' Involvement and Their Commitments	90
Define How Issues Will Be Handled	91
Ensure That the Tools Used by the Various Stakeholders Are Compatible	92
Train Managers in Teamwork	92
Ensure That Software Professionals Are Represented when Defining System Requirements with the Customer	94
Implement Regular Reviews with Representatives of the Various Groups Involved in the Initiative	95
Identify and Manage Critical Dependencies between Stakeholders	96
Communicate Again and Again	97
Manage Expectations from the Start	98

10	Reviewing and Inspecting	99
	Mandate Reviews and Inspections	100
	Train Peer Review Participants	101
	Assign Peer Review Leaders, Especially when There Are Many Reviewers	102
	Ensure Peer Reviews Are in the Plan	103
	Follow the Plan	104
	Collect Data	106
	Make Sure That Quality Assurance Is Part of the Process	107
11	Providing Services to Customers	109
	Seek, Compile, and Review Feedback from Customers	110
	Analyze, Document, and Communicate Customers' Needs	111
	Ensure That Information Provided by Customers Remains Private	112
12	Focusing on Processes	115
	Make It Clear for Everyone That Improving Is a Priority	116
	Periodically Assess Your IT Development and Maintenance Process	117
	Prepare a Plan of Action	118
	Implement the Plan to Define and Improve Organizational Processes	119
	Establish a Library of Process-Related Documentation	121
	Establish a Historical Measurements Repository	122
	Provide Training and Support as Processes Are Deployed	127
13	Training Personnel	129
	Convey the Importance of Training and How It Will Be Provided	130
	Assign the Responsibility for Coordinating Training and Make a Plan	131
	Deliver and Track Planned Training	133
	Maintain and Regularly Review Personnel Training Records	134
	Periodically Assess the Training Relevance and Quality	135
14	Managing IT Initiatives	137
	Mandate That Every IT Initiative Use a Management Approach Based on the Organizational Standard	138
	Provide Tailoring Support and Training	139
	Distribute the Tailored Process to Everyone in the Team	141
	Harmonize Performance and Needs	142
	Measure the Effectiveness of the Organizational Management Approach	143
15	Building a Culture	145
	Document and Communicate the Type of Behavior Valued by the Organization	147
	Hold Frequent Meetings between Management and Personnel	149
	Share Goals and Results Achieved by the Organization with Personnel	150
	Define and Deploy Logical and Flexible Operating Procedures	151

16	The Reality of Information Technology Initiatives	153
	Results Overview	153
	Government versus Private Industry — Services versus Product	
	Development — Small versus Large	156
	Critical Value of Problems Likelihood	158
	Detailed Results	158
	Risk Perception in Key Risk Areas	159
	Risk Mitigation Capacity in Key Process Areas	160
	Likelihood of Experiencing Problems in Key Risk Areas	162
	Likelihood of Experiencing Problems in Key Risk Mitigating	
	Process Areas	162
	Likelihood of Experiencing Problems — Government versus	
	Private Industry	164
	Likelihood of Experiencing Problems — Small versus Large	
	Organizations	167
	Additional Characterization Parameters	171
	Software Quality Index	171
	Potential Instances of Problems	172
	Potential Failure Modes	174
	Some Specifics	176
	The Road to Success	176
	The Living Dead	179
	The Failure	183
	The Success Story	187
17	On Probabilistic Risk Identification, Mapping, and	
	Evaluation	191
	The Complexity of Preventing Losses and Making the Most	
	of Opportunities	192
	PRIME	194
	Application to Information Technology	200
	Selecting the IT Framework	200
	The CMM	202
	The Taxonomy-Based Risk Identification	203
	Tailoring the IT Framework	204
	Implementing the IT Framework	206
18	Conclusion	213
	Annex A : A Crash Course in Statistical Process Control	217
	Quantitatively Managing Processes	218
	Quantitatively Managing Quality	226
	Annex B: Risk Assessment and Estimation of Losses	233
	Index	255