
Contents

Preface	xi
---------------	----

Part I Business-Integrated Quality Systems

1 Organizational Structures	3
General Theory of Organization Structure	5
The Functional/Hierarchical Structure	6
Matrix Organizations	8
Cross-Functional Organization Structure	9
Process- or Product-Based (Horizontal) Organization Structures	10
Forms of Organization	12
2 The Quality Function	15
Juran Trilogy	17
Related Business Functions	23
Safety	23
Regulatory Issues	24
Product Liability	24
Environmental Issues Relating to the Quality Function	28
3 Approaches to Quality	31
Deming's Approach	34
Total Quality Control in Japan	36
ISO 9000 Series	41
Malcolm Baldrige National Quality Award	45
Deming Prize	48
European Quality Award	49
Total Quality Management (TQM)	51
Six Sigma	52
4 Customer-Focused Organizations	57

Part II Integrated Planning

5 Strategic Planning	65
Organizational Vision	67
Strategy Development	69

Strategic Styles	71
Possibilities-Based Strategic Decisions	72
Strategic Development Using Constraint Theory	74
The Systems Approach	75
Basic Constraint Management Principles and Concepts	78
Tools of Constraint Management	87
Constraint Management Measurements	98
6 Understanding Customer Expectations and Needs	105
Customer Classifications	108
Customer Identification and Segmentation	110
Collecting Data on Customer Expectations and Needs	113
Customer Service and Support	114
Surveys	117
Focus Groups	127
7 Benchmarking	129
Getting Started with Benchmarking	132
Why Benchmarking Efforts Fail	134
8 Organizational Assessment	137
Assessing Quality Culture	139
Organizational Metrics	140
Cost of Quality	142

Part III Process Control

9 Quantifying Process Variation	153
Descriptive Statistics	155
Enumerative and Analytic Studies	155
Acceptance Sampling	158
Statistical Control Charts	160
Variable Control Charts	165
Control Charts for Attributes Data	176
Control Chart Selection	189
Control Chart Interpretation	190
Using Specifications for Process Control	196
Process Capability Studies	200
How to Perform a Process Capability Study	200
Statistical Analysis of Process Capability Data	202
Interpreting Capability Indexes	205

10	Quality Audits	209
	Types of Quality Audits	212
	Product Audits	212
	Process Audits	214
	Systems Audits	214
	Internal Audits	215
	Two-Party Audits	215
	Third-Party Audits	215
	Desk Audits	216
	Planning and Conducting the Audit	216
	Auditor Qualifications	217
	Internal Quality Surveys as Preparation	218
	Steps in Conducting an Audit	218
	Audit Reporting Process	219
	Post-Audit Activities (Corrective Action, Verification)	220
	Product, Process, and Materials Control	221
	Work Instructions	221
	Classification of Characteristics	223
	Identification of Materials and Status	224
	Purchased Materials	224
	Customer-Supplied Materials	224
	Work-in-Process (WIP)	224
	Finished Goods	225
	Lot Traceability	225
	Materials Segregation Practices	225
	Configuration Control	225
	Deviations and Waivers	226
11	Supply Chain Management	227
	Scope of Vendor Quality Control	230
	Evaluating Vendor Quality Capability	230
	Vendor Quality Planning	233
	Post-Award Surveillance	234
	Vendor Rating Schemes	235
	Special Processes	236
	Partnership and Alliances	237

Part IV Continuous Improvement

12	Effective Change Management	243
	Roles	246
	Goals	247

	Mechanisms Used by Change Agents	248
	Building Buy-in	248
	Project Deployment	254
	Selecting Projects	254
	DMAIC/DMADV Methodology	262
13	Define Stage	265
	Project Definition	267
	Work Breakdown Structure	268
	Pareto Diagrams	269
	Project Charters	270
	Resources	281
	Top-Level Process Definition	285
	Team Formation	285
	Team Dynamics Management, Including Conflict Resolution	287
	Stages in Group Development	288
	Common Team Problems	289
	Productive Group Roles	289
	Counterproductive Group Roles	290
	Management's Role	292
14	Measure Stage	293
	Process Definition	295
	Metric Definition	296
	Establishing Process Baselines	297
	Measurement Systems Analysis	298
	Levels of Measurement	298
	Definitions	301
15	Analyze Stage	305
	Value Stream Analysis	307
	Analyze Sources of Process Variation	314
	Quality Function Deployment	315
	Cause-and-Effect Diagrams	318
	Scatter Diagrams	319
	Determine Process Drivers	324
	Correlation and Regression Analysis	324
	Least-Squares Fit	326
	Interpretation of Computer Output for Regression Analysis	328

Analysis of Residuals	330
Designed Experiments	331
16 Improve/Design Stage	335
Define New Operating/Design Conditions	337
Define and Mitigate Failure Modes	340
Process Decision Program Chart	340
Preventing Failures	340
Failure Mode and Effects Analysis	344
17 Control/Verify Stage	349
Performance Evaluation	352
Recognition and Reward	353
Principles of Effective Reward Systems	355
Training	356
Job Training	357
Developing a Structured OJT Program	358
Instructional Games, Simulations, and Role-Plays	359

Part V Management of Human Resources

18 Motivation Theories and Principles	367
Maslow’s Hierarchy of Needs	369
Herzberg’s Hygiene Theory	370
Theories X, Y, and Z	370
19 Management Styles	373
Judgmental Management Style	375
Data-Based Management Style	375
Combination Data-Based/Judgment Management Style	376
Participatory Management Style	376
Autocratic Management Style	377
Management by Wandering Around	377
Fourth Generation Management	378
The Fifth Discipline	379
20 Resource Requirements to Manage the Quality Function ...	381
Performance Evaluation	385
Traditional Performance Appraisals	385
Criticisms of Traditional Employee Appraisals	386
Alternatives to Traditional Appraisals	388

x Contents

Professional Development	393
Credentials	393
Professional Certification	393
Professional Development Courses	394
Achieving the Goals	395
Coaching	395
Situations That Require Coaching to Improve Performance	396
Forms of Coaching	397
A Control Chart Constants	399
B Control Chart Equations	403
C Area under the Standard Normal Curve	407
D Simulated Certification Exam Questions	413
References	455
Index	465