Brief Contents

PREFACE xix	
PART 1 UNDERSTANDING	QUALITY CONCEPTS 1
Chapter 1	Differing Perspectives on Quality 3
Chapter 2	Quality Theory 33
Chapter 3	Global Supply Chain Quality and International Quality Standards 64
PART 2 DESIGNING AND A	SSURING QUALITY 105
Chapter 4	Strategic Quality Planning 107
Chapter 5	The Voice of the Customer 137
Chapter 6	The Voice of the Market 171
Chapter 7	Quality and Innovation in Product and Process Design 199
Chapter 8	Designing Quality Services 231
Chapter 9	Managing Supplier Quality in the Supply Chain 263
PART 3 IMPLEMENTING Q	UALITY 293
Chapter 10	The Tools of Quality 295
Chapter 11	Managing Quality Improvement Teams and Projects 338
Chapter 12	Statistically Based Quality Improvement for Variables 373
Chapter 13	Statistically Based Quality Improvement for Attributes 413
Chapter 14	Six-Sigma Management and Tools 437
PART 4 FOREVER IMPROVI	NG THE QUALITY SYSTEM 473
Chapter 15	Managing Learning for Quality Improvement 475
Chapter 16	Implementing and Validating the Quality System 509
APPENDIX 545	
GLOSSARY 549	
INDEX 561	

Contents

REFACE xix
ART 1: UNDERSTANDING QUALITY CONCEPTS 1
CHAPTER 1 Differing Perspectives on Quality 3
Recognizing Different Perspectives on Quality 3
A Closer Look at Quality Which are Better, CDs or LPs? 4
What Is Quality? 4
Differing Functional Perspectives on Quality 8
Quality Highlight Quality Strategy at GE 17
The Three Spheres of Quality 24
Other Perspectives on Quality 25
Quality Highlight Federal Express Corporation 26
Arriving at a Common Understanding of Quality Using a Contingend Perspective of Quality 27
Summary 27
Key Terms 28
Discussion Questions 28
Case 1-1: FedEx: Managing Quality Day and Night 29
Case 1-2: Granite Rock Company: Achieving Quality through Employees 31
CHAPTER 2 Quality Theory 33
Introduction 33
What Is Theory? 33
A Closer Look at Quality The Product That Is Quality 35
Leading Contributors to Quality Theory: W. Edwards Deming 36
Leading Contributors to Quality Theory: Joseph M. Juran 43
A Closer Look at Quality Juran on the Past Century of Quality 46
Leading Contributors to Quality Theory: Kaoru Ishikawa 47
Leading Contributors to Quality Theory: Armand Feigenbaum 48
Leading Contributors to Quality Theory: Philip Crosby 49
Leading Contributors to Quality Theory: Genichi Taguchi 51

Leading Contributors to Quality Theory: The Rest of the Pack

A Closer Look at Quality Hammer Recants (Sort of), or In Search of the Lost Product to Sell 55	
Resolving the Differences in Quality Approaches: An Integrative View 56	í
Theoretical Framework for Quality Management 59	,
Summary 60	
Key Terms 60	
Discussion Questions 60	
Case 2-1: Rheaco, Inc.: Making a Quality Turnabout by Asking for Advice	6
Case 2-2: Has Disney Developed a Theory of Quality Guest Services Management? 62	
CHAPTER 3 Global Supply Chain Quality and International Quality Standards 64	
Introduction 64	
Managing Quality for the Multinational Firm (MNF) 64	
Quality Highlight Supply Chain Quality in the Global Context 69	
Quality Improvement: The American Way 70	
The Malcolm Baldrige National Quality Award 70	
A Closer Look at Quality Who Was Malcolm Baldrige? 79	
Quality Highlight Clarke American Checks, Inc. 83	
Quality Improvement: The Japanese Way 85	
Quality Improvement: The European Way 90	
ISO 9000:2000 91	
Quality Improvement: The Chinese Way 97	
Are Quality Approaches Influenced by Culture? 100	
Summary 101	
Key Terms 101	
Discussion Questions 101	
Case 3-1: University of Wolverhampton: Becoming an ISO 9000 University 1	02
Case 3-2: Wainwright Industries: An Entirely New Philosophy of Business Based on Customer Satisfaction and Quality 103	
PART 2: DESIGNING AND ASSURING QUALITY 105	
CHAPTER 4 Strategic Quality Planning 107	
Strategy Content 107	
The Importance of Time in Quality Improvement 107	

A Closer Look at Quality Problems with Measuring

109

Educational Performance

Viewing Quality Theory from a Contingency Perspective

```
Leadership for Quality
                                  110
        Quality and Ethics
                              112
             Quality Highlight Solectron Corporation
                                                     113
        Quality As a Strategy
                                114
        Quality Strategy Process
                                    121
             A Closer Look at Quality A Mature Strategic Planning Process
                                                                        122
        Deploying Quality (Hoshin Kanri)
                                             123
        Does Quality Lead to Better Business Results?
                                                         124
        Supply Chain Strategy
                                 128
        Summary
                     131
        Key Terms
                      131
        Discussion Questions
                                131
        Problems
                     132
        Case 4-1: Ames Rubber Corporation: Realizing Multiple Benefits through
          Improved Quality
                                134
        Case 4-2: Make No Mistake—At Eastman Chemical, Quality
          is a Strategic Issue
                                135
CHAPTER 5 The Voice of the Customer
                                                  137
        Customer-Driven Quality
                                     138
             A Closer Look at Quality Customer Service on the Internet
                                                                    139
        What Is the Voice of the Customer?
                                              139
        Customer-Relationship Management
                                               141
             A Closer Look at Quality The Customer Is Always . . . Thwarted
                                                                        144
        The "Gaps" Approach to Service Design
                                                   146
        Segmenting Customers and Markets
                                               146
        Strategic Supply Chain Alliances between Customers and Suppliers
                                                                            148
        Communicating with Customers
                                           152
        Actively Solicited Customer-Feedback Approaches
                                                             152
             A Closer Look at Quality Misusing Surveys
                                                       155
             Quality Highlight ADAC Industries
                                                158
       Passively Solicited Customer-Feedback Approaches
                                                             159
        Managing Customer Retention and Loyalty
       Customer-Relationship Management (CRM) Systems
                                                               163
        A Word on Excellent Design
                                       165
       Summary
                     166
       Key Terms
                      166
       Discussion Questions
                                167
       Problems
                     168
```

Case 5-1: Customer Quality Feedback at Apple Computer 168
Case 5-2: Chaparral Steel: Achieving High Quality through a Commitment to Both External and Internal Customers 169
CHAPTER 6 The Voice of the Market 171
What Do We Mean by the Voice of the Market? 171
Gaining Insight through Benchmarking 172
Quality Highlight Pal's Sudden Service 174
Purposes of Benchmarking 176
Difficulties in Monitoring and Measuring Performance 177
Commonly Benchmarked Performance Measures 179
Best-in-Class Benchmarking 181
Best-of-the-Best Benchmarking 181
Business Process Benchmarking 182
Leading and Managing the Benchmarking Effort 185
A Closer Look at Quality Toyota: Benchmarking American Auto Companies (Before It Was Called Benchmarking) 187
Baselining and Reengineering 188
A Closer Look at Quality The Legal Environment of Benchmarking 189
Problems with Benchmarking 190
Summary 191
Key Terms 191
Discussion Questions 191
Problems 192
Case 6-1: Amgen Corporation: Using Benchmarking as a Means of Coping with Rapid Growth 195
Case 6-2: Ameritech: Making Benchmarking a Part of the Process Improvement Toolkit 197
CHAPTER 7 Quality and Innovation in Product and Process Design 199
Designing Products for Quality 199
The Design Process 200
Quality Highlight A Turnaround at Kellogg's Cereals: Driven by Design 202
Quality Function Deployment (QFD) 203
Technology in Design 208
Prototyping Methodologies 211
A Closer Look at Quality Ski Design 213
A Closer Look at Quality Why It Takes a Rocket Scientist to Design a Golf Ball 215
Quality Highlight Focus on DFM at General Motors 217

Designing for Reliability 218
Quality Highlight Designing Reliable Luxury at Vuitton 219
Environmental Considerations in Design 224
Summary 225
Key Terms 225
Discussion Questions 225
Problems 226
Case 7-1: Designing the Ford Taurus: Why Quality Had to Be Job 1 228
Case 7-2: Nucor Corporation: Producing Quality Steel by Stressing Sound Management Practices 229
CHAPTER 8 Designing Quality Services 231
Differences between Services and Manufacturing 231
What Do Services Customers Want? 234
A Closer Look at Quality Service Warranties: Profitable or a Rip-Off—You Decide 235
Servqual 236
Quality Highlight Ritz-Carlton Hotels 237
Designing and Improving the Services Transaction 244
A Closer Look at Quality Moments of Truth in Action 247
The Customer Benefits Package 248
Service Transaction Analysis 250
The Globalization of Services 252
Improving Customer Service in Government 253
A Closer Look at Quality Government Service Quality: A Stop-and-Go Process 254
Quality in Health Care 255
Supply Chain Quality in Services 255
A Theory for Service Quality Management 256
Summary 257
Key Terms 257
Discussion Questions 257
Problems 258
Case 8-1: Yahoo! Designs Quality Services with Customers in Mind 260
Case 8-2: UPS: Delivering the Total Package in Customer Service 261
CHAPTER 9 Managing Supplier Quality in the Supply Chain 263
The Value Chain 263
A Closer Look at Quality Supply Chains and Terrorism 266
Supplier Partnering 267
Quality Highlight Supplier Partnerships at Mercedes-Benz 269

Supplier Development 270
Applying the Contingency Perspective to Supplier Partnering 271
A Supplier Development Program: ISO/TS 16949 272
Acceptance Sampling and Statistical Sampling Techniques 274
Quality Highlight Integrating Forward Along the Supply Chain: 3M Dental Products Division 274
A Closer Look at Quality For RFID to Take Hold, Reliability Needs to Improve 276
Summary 286
Key Terms 286
Discussion Questions 286
Problems 287
Case 9-1: SBC: Setting High Standards for Suppliers and Rewarding Supplier Performance 289
Case 9-2: Managing the Supply Chain at Honeywell 290
PART 3: IMPLEMENTING QUALITY 293
CHAPTER 10 The Tools of Quality 295
Improving the System 295
Ishikawa's Basic Seven Tools of Quality 296
A Closer Look at Quality Extended Process Mapping of Supply Chains 30.
The Seven New Tools for Improvement 314
Other Tools for Performance Measurement 326
Summary 329
Key Terms 330
Discussion Questions 330
Problems 331
Case 10-1: Corporate Universities: Teaching the Tools of Quality 335
Case 10-2: Lanier: Achieving Maximum Performance by Supporting Quality Products with Quality Services 336
CHAPTER 11 Managing Quality Improvement Teams and Projects 338
7 11 CD C O 11 7 240
Leading Teams for Quality Improvement 340
A Closer Look at Quality Empowerment in Action 342
A Closer Look at Quality Empowerment in Action 342 Types of Teams 346 Implementing Teams 348
A Closer Look at Quality Empowerment in Action 342 Types of Teams 346

ΧV

Summary 364
Key Terms 366
Discussion Questions 366
Problems 367
Case 11-1: Whole Foods: Using Teamwork as a Recipe for Success 370
Case 11-2: The Boeing 777: Designing and Building an Airplane Using Virtual Teams 371
CHAPTER 12 Statistically Based Quality Improvement for Variables 373
Statistical Fundamentals 373
Quality Highlight Statistical Tools in Action 375
Process Control Charts 379
Some Control Chart Concepts for Variables 398
Process Capability for Variables 398
A Closer Look at Quality A Justification for Meeting Standards in Software Quality 400
Other Statistical Techniques in Quality Management 405
Summary 406
Key Terms 406
Discussion Questions 406
Problems 407
Case 12-1: Ore-Ida Fries 411
CHAPTER 13 Statistically Based Quality Improvement for Attributes 41
Generic Process for Developing Attributes Charts 414
Understanding Attributes Charts 414
Attributes Charts Summary 423
Choosing the Right Attributes Chart 423
Reliability Models 423
A Closer Look at Quality Is Quality on the Decline? 428
Summary 429
Key Terms 430
Discussion Questions 430
Problems 430
Case 13-1: Decision Sciences Institute National Conference 434
CHAPTER 14 Six-Sigma Management and Tools 437
What Is Six Sigma? 437
Organizing Six Sigma 439

Force-Field Analysis

DMAIC Overview

	A Closer Look at Quality DMAIC in Action 442
	Define Phase 443
	Measure Phase 444
	Analyze Phase 454
	Improve Phase 456
	Control Phase 456
	Taguchi Design of Experiments 456
	Background of the Taguchi Method 457
	The Taguchi Process 459
	Design for Six Sigma 463
	Lensing Six Sigma from a Contingency Perspective 463
	Summary 465
	Key Terms 465
	Discussion Questions 465
	Problems 465
	Case 14-1: The Neiman-Marcus Cookie 470
PART 4: FOREVER I	MPROVING THE QUALITY SYSTEM 473
CHAP	TER 15 Managing Learning for Quality Improvement 475
СНАР	PTER 15 Managing Learning for Quality Improvement 475 Effective Story Telling 475
СНАР	- · · · · · · · · · · · · · · · · · · ·
СНАР	Effective Story Telling 475
СНАР	Effective Story Telling 475 Individual Learning and Organizational Learning 478
СНАР	Effective Story Telling 475 Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479
СНАР	Effective Story Telling 475 Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481
СНАР	Effective Story Telling 475 Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481 Adult Learning 495
СНАР	Effective Story Telling 475 Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481 Adult Learning 495 Training Tools 499
СНАР	Effective Story Telling 475 Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481 Adult Learning 495 Training Tools 499 Evaluating Training 502 Case 15-1: British Petroleum: Achieving Organizational Learning Through
	Effective Story Telling 475 Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481 Adult Learning 495 Training Tools 499 Evaluating Training 502 Case 15-1: British Petroleum: Achieving Organizational Learning Through the Creative Use of Video Technology 506
	Effective Story Telling 475 Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481 Adult Learning 495 Training Tools 499 Evaluating Training 502 Case 15-1: British Petroleum: Achieving Organizational Learning Through the Creative Use of Video Technology 506 Case 15-2: At Globe Metallurgical, Training Is a Way of Life 507
	Effective Story Telling 475 Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481 Adult Learning 495 Training Tools 499 Evaluating Training 502 Case 15-1: British Petroleum: Achieving Organizational Learning Through the Creative Use of Video Technology 506 Case 15-2: At Globe Metallurgical, Training Is a Way of Life 507 TER 16 Implementing and Validating the Quality System 509 Building Blocks for the System of Quality Improvement 510 Quality Highlight Back to Basics at Ford 514
	Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481 Adult Learning 495 Training Tools 499 Evaluating Training 502 Case 15-1: British Petroleum: Achieving Organizational Learning Through the Creative Use of Video Technology 506 Case 15-2: At Globe Metallurgical, Training Is a Way of Life 507 PTER 16 Implementing and Validating the Quality System 509 Building Blocks for the System of Quality Improvement 510 Quality Highlight Back to Basics at Ford 514 Internal Validation: Documenting and Assessing the Quality System 516
	Effective Story Telling 475 Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481 Adult Learning 495 Training Tools 499 Evaluating Training 502 Case 15-1: British Petroleum: Achieving Organizational Learning Through the Creative Use of Video Technology 506 Case 15-2: At Globe Metallurgical, Training Is a Way of Life 507 PTER 16 Implementing and Validating the Quality System 509 Building Blocks for the System of Quality Improvement 510 Quality Highlight Back to Basics at Ford 514 Internal Validation: Documenting and Assessing the Quality System 516 Quality Audits 517
	Individual Learning and Organizational Learning 478 Quality Highlight Motorola's Quality University 479 A Model to Guide Training in an Organization 481 Adult Learning 495 Training Tools 499 Evaluating Training 502 Case 15-1: British Petroleum: Achieving Organizational Learning Through the Creative Use of Video Technology 506 Case 15-2: At Globe Metallurgical, Training Is a Way of Life 507 PTER 16 Implementing and Validating the Quality System 509 Building Blocks for the System of Quality Improvement 510 Quality Highlight Back to Basics at Ford 514 Internal Validation: Documenting and Assessing the Quality System 516

CONTENTS xvii

Externally Validating the Quality System 526

Case 16-1: Setting Priorities Using the Baldrige Criteria 532

APPENDIX 545

GLOSSARY 549

INDEX 561