## **Managing Quality**

### **Fourth Edition**

EDITED BY BARRIE G. DALE



	List of fisures	XIII
	List of tables and boxes	xvi
	List of standards	xviii
	List of abbreviations	XX
	List of contributors	xxiii
	Preface	xxiv
Part 1	The Development, Introduction and Sustaining of Total	
	Quality Management (TQM)	1
Chapter 1	TQM: An Overview	3
	B. G. DALE	
	Introduction	3
	What is Quality?	4
	Why is Quality Important?	11
	The Evolution of Quality Management	21
	The Key Elements of TQM	27
	Summary: Developing TQM	30
Chapter 2	The Role of Management in TQM	34
	B. G. DALE	
	Introduction	34
	The Need for Senior Managers to Get Involved in TQM	35
	What Senior Managers Need to Know about TQM	39
	What Senior Managers Need to Do about TOM	12

	The Role of Middle Managers	48
	The Role of First-Line Managers	48
	Summary	49
Chapter 3	The Received Wisdom on TQM	51
	B. G. DALE	
	Introduction	51
	Crosby	51
	Deming	53
	Feigenbaum	55
	Man	56
	Are the Approaches of these Gurus Different?	57
	lmai	58
	Ishikawa	59
	Shingo	60
	Taguchi	60
	Japanese-Style Total Quality	62 64
	Summary	04
Chapter 4	The Introduction of TQM	66
	B. G. DALE	
	Introduction	66
	Change and Continuous Improvement	67
	Forces for Change	68
	How Do Companies Get Started?	70
	Approaches to TQM	71
	Summary	76
Chapter 5	A Framework for the Introduction of TQM	77
	B. G. DALE	
	Introduction	77
	Organizing	80
	Systems and Techniques	83
	Measurement and Feedback	85
	Changing the Culture	88
	Use of the Framework	92
	Summary and Outcomes	94
Chapter 6	Levels of TQM Adoption	97
	B. G. DALE AND D. M. LASCELLES	
	Introduction	97
	Level 1 - Uncommitted	98
	Level 2 - Drifters	101
	Level 3 - Tool-Pushers	103

	Level 4 - Improvers  Level 5 - Award-Winners  Level 6 - World-Class  Summary	105 107 108 110
Chapter 7	Sustaining TQM B. G. DALE	111
	Introduction TQM Sustaining Audit Tool: Development and Methodology Category 1 - Internal/External Environment Category 2 - Management Style Category 3 - Policies Category 4 - Organization Structure Category 5 - Process of Change Summary	111 113 114 118 119 121 124
Part 2	The Business Context of TQM	131
Chapter 8	Policy Deployment R. G. LEE AND B. G. DALE	133
	Introduction Definitions: Policy Deployment What is Policy Deployment? What Policy Deployment is Not The Policy Deployment Process A Check-Reflect-Improve-Scrutinize-Pass (CRISP) Approach to Policy Deployment Summary	133 135 135 139 140 147
Chapter 9	Quality Costing B. G. DALE	155
	Introduction Definition and Categorization of Quality Costs Collecting Quality Costs Some Cost Aspects of Manufacturing Industry Reporting Quality Costs Uses of Quality Costs Summary	155 156 159 163 167 169
Chapter 10	Managing Human Resources for Quality Management  A. WILKINSON AND A. BROWN	176
	Introduction QM: The HR Concerns The Two Sides of QM QM and the Management of People	176 176 177 178

VIII Contents

	HR Policies and Practices	181
	Employee Involvement	181
	Organizational Culture	184
	Training and Education Selection	185
		186 187
	Appraisal Pou	188
	Pay Employee Well-Being	190
	Industrial Relations	192
	Employment Security	194
	Integration	194
	Summary	198
Chapter 11	Managing Service Quality •	203
·	B. R. LEWIS	
	Introduction	203
	The Service Environment	204
	Defining Service Quality The Pale of Personnel in Service Pelinens	206 212
	The Role of Personnel in Service Delivery	214
	Service Delivery Summary	219
Chapter 12	Supplier Development	223
	B. BURNES and B. G. DALE	
	Introduction	223
	Long-Term Issues of Partnership	224
	Barriers to Developing Partnerships	225
	Conditions of Partnership	228 229
	The Issues to be Considered in Partnership The Process of Partnership	232
	Potential Difficulties of Operating Partnerships	234
	Summary	234
Chapter 13	Business to Business, Old-Economy Businesses and the Quality Function R WILLIAMS AND R VISSER	238
	Introduction	238
	What is the Effect of the Internet on Business Transactions?	238
	Medium and Large Old-Economy Companies and the New Economy	239
	Companies Buying and Selling on the Internet	241
	Virtual Communities or Total Value Chain Integration	245
	Disaggregation and Organizational Revolution	246
	What will the Speed of Change Be?	248
	Possible Effects on the Quality Function	250
	Disaggregation and Maximizing Assets	252
	Summary ••	253

Part 3	Quality Management Systems, Tools and Techniques	259
Chapter 14	Quality Management Systems  B. G. DALE	261
	Introduction	261
	What is Quality Assurance?	261
	What is a Quality Management System?	262
	The Development of Quality Management System Standards	263 268
	The ISO9000 Series of Standards: An Overview	271
	Implementation Guidelines for ISO9001	271
	Quality Management System Assessment and Registration	274
	ISO9000 Series Registration: A Model for Small Companies	275
	Benefits and Limitations of the ISO9000 Series of Standards Summary	284
01		205
Chapter 15	Integrated Management Systems G. WILKINSON AND B. G. DALE	287
	Introduction	287
	The Case for Integration and Some of the Problems	288
	The ISO9001/ISO14001 Matrix	293
	Interlinked Systems	297
	The EFQM Model	298
	A Comparative Analysis of the Current Integration Models	300
	The Key Integration Issues	302
	An Integrated Management Systems Model	303
	Summary	304
Chapter 16	Tools and Techniques: An Overview B. G. DALE	308
	B. G. DALE	
	Introduction	308
	Selecting Tools and Techniques	309
	Difficulties and Issues Relating to the Use of Tools and Techniques	312
	Problem-Solving Methodology	313
	Checklists	317
	Flowcharts	317
	Checksheets	321
	Tally Charts and Histograms	322
	Graphs	324
	Pareto Analysis	325
	Cause-and-Effect Diagrams	327
	Brainstorming	329
	Scatter Diagrams and Regression Analysis	330
	The Seven Management Tools	331
	Housekeeping	339
	Departmental Purpose Analysis	340
	Mistake-Proofing •	344

	Total Productive Maintenance	346
	Summary	347
Chapter 17	Quality Function Deployment	349
	I. FERGUSON AND B. G. DALE	
	Introduction	349
	Understanding Customer Needs	351
	The QFD Road: The Main Steps	353
	Deploying Customer Needs into Product and Process Definition	360
	The Benefits of the Four-Stage Approach	362
	QFD and the Service Sector	362
	Difficulties Associated with QFD	362
	Implementation of QFD	364
	Summary	365
Chapter 18	Design of Experiments	367
	I. FERGUSON AND B. G. DALE	
	Introduction	367
	Methods of Experimentation	368
	Taguchi: An Overview of his Approach	373
	Achieving Robust Design: An Example from Tile Manufacturing	374
	Steps in Experimental Design	377
	Summary	385
Chapter 19	Failure Mode and Effects Analysis	387
	J. R. ALDRIDGE AND B. G. DALE	
	Introduction	387
	What is Failure Mode and Effects Analysis?	387
	Development of a Design FMEA	393
	Development of a Process FMEA	393
	Analysis of Failure Data	394
	Recommended Actions for Design and Process FMEA	395
	Background to the Use of FMEA at Allied Signal Automotive	395
	Developing the Use of FMEA at Allied Signal Automotive	396
	Summary	399
Chapter 20	Statistical Process Control	402
	B. G. DALE AND P. SHAW	
	Introduction	402
	What is Statistical Process Control?	403
	The Development of Statistical Process Control	403
	Some Basic Statistics: Averages and Measures of Dispersion	404
	Variation and Process Improvement	405
	Variable and Attribute Data	408
	Data-Collection	409
	Construction of Control Charts Using Variables Data	411
	Interpreting a Variables Control Chart	412

	Construction of Control Charts Using Attribute Data Construction and Interpretation of Control Charts: Dos and Don'ts Process Capability Implementation of SPC Difficulties Experienced in Introducing and Applying SPC Summary	415 416 417 420 422 425
Chapter 21	Benchmarking R. LOVE and B. G. DALE	427
	Introduction	427
	Company Background	429
	Why Benchmarking?	431
	Success Factors	432
	Difficulties and Pitfalls	434
	Key Lessons	436
	Summary	439
Chapter 22	Business Process Re-engineering	441
	J. MACDONALD AND B. G. DALE	
	Introduction	441
	Approaches Used in BPR	443
	The Principles of BPR	444
	Risks and Benefits of BPR	445
	Implementation of BPR	446
	BPR Methodology	448
	Summary	450
Chapter 23	Teams and Teamwork	453
	B. G. DALE	
	Introduction	453
	The Role of Teams in Continuous Improvement	454
	Types of Teams	455
	Differences between Teams	458
	Commonalities between Teams	460
	Evaluation of Teams	462
	Team Competition	467
	Guidelines for Developing Effective Teams	468
	Summary	470
Chapter 24	Self-Assessment, Models and Quality Awards B. G. DALE	472
	Introduction	472
	Quality, TQM and Excellence	475
	Award Models	477
	The Self-Assessment Process	485
	Success Factors for Self-Assessment	491

xii Contents

	Difficulties with Self-Assessment Summary	493 493
Part 4	TQM through Continuous Improvement	497
Chapter 25	Managing Quality: Epilogue B. G. DALE	499
	Introduction The Importance of Quality TQM: A Continuous Process Measuring Progress towards TQM TQM Issues which Need to be Considered in the Future Summary	499 499 500 501 504 511
	Index	514