658.575 2 ETT

CONTENT

Contributors	ix
Pretace	X1
Acknowledgments	X111
Part 1 Issues and Opportunities	
Chapter 1 Managing the Design Process	1
Introduction	1
Disciplined Anticipation	3
The B24 Liberator	5
The 1955 Chevrolet : A "Fast Lane" Product Launch	8
Managing the Innovation Process	12
When It all Comes Together	14
Summary	20
References	20
Chapter 2 Bridging the Culture of Engineers : Challenges in Organizing for Manufacturable	e
Product Design	21
Introduction	21
Perspectives on Organizational Culture	25
The culture of Product Engineering	31
The Culture of Manufacturing Engineers	36
Perspectives on Managing the Design-Manufacturing Interface	42
Summary	49
Notes	50
References	51
Chapter 3 Methods That Work for Integrating Design and Manufacturing	53
Introduction	53
The Design-Manufacturing Paradox	55
The Five Key Integrating Actions	56
Outcomes of Successful Design-Manufacturing Integration	57
Ratio of Manufacturing Engineers to Design Engineers	58
Structuring For Design-Manufacturing Integration	59
Satisfaction With the Process of Design-Manufacturing Integration in a Unit	64
Successful Design-Manufacture Integration	66
Summary	68
Cautions for Reorganizing	69
Appendix 3.1	70
References	11
Chapter 4 Design for Life-cycle Manufacturing	79
Introduction	79
Underlying Concepts	80
Improving the Design Process	89
DFM Approaches	93
Summary	112
References	113

Part 2 Case Histories	115
Chapter 5 Revitalizing the Manufacturing and Design of Mature Global Products	117
Introduction	117
Black & Decker	118
The Results of Double Insulation	125
Summary and Conclusions	130
Appendix 5.1 Competitor Analysis by Sunbeam Appliance Co.	130
Chapter 6 GM : The Quad-4 Engine	133
	155
The Product Program	135
Suppliers	139
The Role of quality in the Buyoff	144
Plant Organization	144
Outcomes of the Quad-4 program	149
Appendix 6.1 BOC – Powertrain Delta Engine Supplier Survey References	153
References	157
Chapter 7 GE : Product-Process Development Management	159
Introduction	159
Organizing for Change	160
Reducing New Product Introduction Time	170
The Project Approach	173
The Salisbury Project : The Story Behind the Story	181
Summary	184
References	185
Chapter 8 IBM Corporation : Early Manufacturing Involvement (EMI)	187
Introduction	187
IBM Rochester, Minnesota	187
Early Manufacturing Involvement (EMI)	188
One-Pass Design	189
EMI Product Focus	191
EMI Process Focus	192
Manufacturing Designers	195
Conclusions	195
	201
Chapter 9 A.B. chance : Integration of the Design Process	201
Introduction	201
Company Design History	202
Management of the Design Process	207
Problems, Results, and Expectations	212
Conclusion	220
References	221
Chapter 10 Northern Telecom : the Gate Procedure	223
Introduction	223
Northern Telecom	224
Teamwork and Techniques : A Response to New Technological Challenges	226
Frequent, Short-Cycle Projects : The Gate Procedure Response	229
Gates and Gate Reviews	231
"Prime" Responsibility	233
The Stages of New Product Development	234
The gate Procedure in Operation	236
The Gate Procedure : Management Tool or Replacement?	241
Conclusions	241
Chapter 11 Implementing Simultaneous Engineering at Cadilac	212
Introduction	243
maouuuun	2 4 3

Create a Vision with Organization Support	244
Develop Steering Committee	245
Analysis	246
Organization Design and Planning	246
Implementation	249
Development and Continuous Improvement	251
Learning	252
Part 3 Baseline for the Future	255
Chapter 12 Integrated Design Management	257
Introduction	257
New Principles	257
Economic Planning for Design	268
Summary	275
References	277
Index	279