CONTENTS

N Fa	About the Editors Notes on Contributors Foreword Preface	
	RT I ne Remarkable History of POM	. 1
1	Evolution of the POM Discipline	3
	Martin K. Starr, Sushil K. Gupta, and Christopher Tang	
	1 Introduction to Evolving POM 3	
	2 The Value of Historical Perspective for POM 4	
	3 First POM Milestone—The Division of Labor 5	
	3.1 The Holistic Production System of Volvo (Opposite to	
	Division of Labor) 6	
	3.2 Division of Labor Applied to Services 6	
	4 Second POM Milestone—Interchangeable Parts (IP) and the Science	
	of Tolerance Ranges 7	
	5 Third POM Milestone—Statistical Quality Control (SQC) and	
	Standardization 8	
	5.1 Standardized Parts and Operations 9	
	6 Four Industrial Revolutions—IR 1.0, IR 2.0, IR 3.0, and IR 4.0 10	
	6.1 The First Industrial Revolution (IR 1.0), 1776 to 1840 10	
	6.2 The Second Industrial Revolution (IR 2.0), 1840 to 1914 11	
	6.3 The Third Industrial Revolution (IR 3.0), 1914 to 1999 12	
	6.4 Industry 4.0: The Fourth Industrial Revolution (IR 4.0), 1999 and beyond 13	
	7 Global Forces Acting on POM 15	
	8 Global Competition: The Japanese Effect 15	
	o otobar compension. The Japanese Effect 10	

9 O	utsourcing to China 16
10 Sı	astainability—Social Responsibility—Crisis Management 18
11 W	That is Next?—Industry 4.0 19
11	.1 Global Trade Processes 19
11	.2 Sharing Economy 20
11	.3 Data Analytics/Robotics—Phenomenon-Driven Research 20
	onclusions 20
	ences and Bibliography 21
ICICI	cifees and Distriguish = 1
Globa	ıl Supply Chain Management
	que L. Correa
	roduction 24
	chnological Evolution 24
	day's Competition: Between Supply Chains, Not Companies 25
	storical Evolution of Supply Chain Management 25
	First Phase: The Operation Management Scope Is the Production
1.1	Unit—"One Best Way" 25
42	Second Phase: The Operations Management Scope Crosses Borders
7.2	Between Functions 26
43	Third Phase: The Operations Management Scope Crosses Borders
	Between Organizations—Supply Chains 26
4 4	Fourth Phase: The Operations Management Scope Crosses National
	Borders—Global Supply Chains 27
4 5	Fifth Phase: The Operations Management Scope Crosses
	the Borders of Organizations' Global Objectives—The Triple
	Bottom Line 27
5 Ev	eryone Wins With Good Supply Chain Management 27
	pply Chain Management: Some Essential Concepts 28
	The Strategic "Make or Buy" Decision 28
0.1	6.1.1 Transaction Cost Economics 29
	6.1.2 Resource-Based View of Strategy 30
6.3	6.1.3 A Framework for the Strategic "Make or Buy" Decision 30 2 Supply Chain Segmentation 31
0.2	
	6.2.1 What Is the Right Supply Chain for Your Product? 32
	6.2.2 Aligning Competences in Supply Chains 34
	6.2.3 Avoiding Incentive Misalignment Among the Constellation
6.3	of Partners in Supply Chains 34
0.0	The Bullwhip Effect: Caused by Lack of Communication and
6.	Coordination Between Partners in Supply Chains 35
7 0.	4 Risk Assessment in Supply Chains 38
Refer	onclusion and Directions for Future Research 40 rences and Bibliography 40
~ ~ ~ ~ ~ L	SARSES MILL DIDITOVERHITY 411

	RT II ore POM Functions	43
3	Forecasting: State-of-the-Art in Research and Practice Nada R. Sanders	45
	1 Introduction to Forecasting in POM 45	
	1.1 Forecasting Versus Planning 451.2 Demand Management 46	
	1.3 Impact on Costs 47	
	2 The Forecasting Process 47	
	2.1 Steps in the Forecasting Process 47	
	2.2 Factors in Method Selection 49	
	3 Forecasting Methodologies 50	
	3.1 Categorization of Forecasting Methods 50	
	3.1.1 Judgmental Forecasting Methods 51	
	3.1.2 Statistical Forecasting Methods 52	
	3.2 Combining Forecasting Methods 52	
	3.2.1 Combining Judgmental and Statistical Methods 53	
	3.2.2 The Role of Domain Knowledge and Contextual Information	55
	4 The Future of Forecasting 55	
	4.1 Information Access 56	
	4.2 Big Data Analytics 56	
	4.3 Information Sharing 57	
	5 Relevance for Managers 57	
	6 Research Opportunities 58	
	7 Conclusion 59	
	References and Bibliography 59	
4	Aggregate Production Planning	63
	Lee Krajewski	
	1 Introduction 63	
	1.1 The Importance of Aggregate Production Planning 63	
	1.2 Dimensions of Aggregation 63	
	1.2.1 Products 64	
	1.2.2 Workforce 64	
	1.2.3 Time 64	
	1.3 Information Inputs 64	
	1.4 Decision Variables and Supply Options 65	
	2 Historical Perspective of Aggregate Production Planning Research 66	
	2.1 Linear Decision Rules 66	
	2.1.1 Regular Time Wages 66	
	2.1.2 Overtime Wages 67	
	2.1.3 Hiring and Firing Costs 67	

		2.1.4 Inventory and Backorder Costs 672.1.5 Objective Function and the Rules 67	
	2.2	Linear Programming 68	
		Heuristics 69	
	2.4	Evaluation of Early Aggregate Planning Models 70	
	2.5	Goal Programming and Other Methodological Thrusts 70	
3	Dis	aggregation of Aggregate Production Plans 71	
	3.1	Levels in Operations Planning and Scheduling 72	
		3.1.1 Level 1 73	
		3.1.2 Level 2 73	
		3.1.3 Level 3 73	
	3.2	Manufacturing 74	
		3.2.1 Hierarchical Production Planning (HPP) 74	
		3.2.2 Setups, Resource Profiles, and Distribution Plans 74	
	3.3	Services 75	
4	Agg	gregate Production Planning in Practice 75	
	4.1	Step 1: Roll the Plan Forward 76	
	4.2	Step 2: Forecast and Demand Planning 76	
	4.3	Step 3: Update the Sales and Operations Plan 76	
	4.4	Step 4: Consensus Meetings 76	
	4.5	Step 5: Executive S&OP Meeting 76	
		Step 6: Update and Revise Final Plans 77	
5		nclusions 77	
	5.1	Future Research 77	
		5.1.1 Employment Planning in Manufacturing 77	
		5.1.2 Employment Planning in Services 77	
		5.1.3 Aggregation 77	
		5.1.4 Uncertainty 78	
		5.1.5 Sustainability and Reverse Logistics 78	
	_	5.1.6 Supply Chain Visibility 78	
_		Implications for Practitioners 79	
R	etere	ences and Bibliography 79	
So	hed	uling in Manufacturing and Services	82
		ok Lee and Michael Pinedo	02
		roduction 82	
	1.1	Classifications of Scheduling Problems 83	
2	Pre	liminaries and Fundamentals 84	
		Computational Complexity of Scheduling Problems 84	
	2.2	Solution Methodologies 85	
3		reduling in Manufacturing 86	
	3.1	Job Shop Scheduling 86	
		3.1.1 Scheduling Problems with the Total Weighted Completion	
		Time Objective 86	
		3.1.2 Scheduling Problems with the Total Completion Time Objective 8	7

	3.2 Resource Constrained Project Scheduling 91	
	4 Scheduling in Services 92	
	4.1 Personnel Scheduling 92	
	4.1.1 Mathematical Formulation 92	
	4.1.2 Impact of Breaks 93	
	4.2 Appointment Scheduling 94	
	4.2.1 Appointment Overbooking 94	
	4.2.2 Characteristics of Optimal Appointment Schedules 95	
	5 Managerial Implications 95	
	5.1 Design of Scheduling Systems 95	
	5.2 Dealing with Randomness 97	
	6 Conclusions and Future Research Directions 97	
	References and Bibliography 98	
6	Inventory Management	10
	Prem Vrat	
	1 Introduction 101	
	2 Functions of Inventory 102	
	3 Inventory Problem Formulation 103	
	3.1 Inventory Policy 103	
	3.2 Inventory Models 104	
	4 Inventory Research—A Historical Profile 106	
	5 Some Select Inventory Models 111	
	5.1 The Classical EOQ Model 111	
	5.2 Variants of the Classical EOQ Model 112	
	5.2.1 A Generalized Type (1, 2, 3) System 114	
	5.2.2 Inventory Model with Lost Sales Case 114	_
	5.3 Multi-Item Single Source EOQ Model: Coordinated Replenishment 11	5
	5.4 A Simple Model for Periodic Review Policy 115	
	5.5 Inventory Models with Quantity Discounts 116	117
	5.6 Probabilistic Inventory Models with Demand and/or Supply Variability	11/
	5.6.1 Inventory Models for Slow-Moving Items 119	`
	6 Inventory Related Issues and Their Implications on Practicing Managers 120	,
	7 Role of Professional Societies in Promoting Scientific Inventory	
	Management 121	
	8 Some Suggested Areas for Future Research Efforts 122	
	9 Concluding Remarks 123	
	References and Bibliography 123	
7	Quality Management	125
	Peter W. Robertson, Martin K. Starr, and Sushil K. Gupta	
	1 Introduction 125	

3.1.3 Scheduling Problems with the Makespan Objective 883.1.4 Job Shop Scheduling with Additional Features 89

3.1.5 The Shifting Bottleneck Heuristic for Job Shop Scheduling 90

2 The Context of QM Successes and Failures 126	127
3 A Compelling Case for Achieving Quality Management Excellence in POM	
4 A Brief History of Quality Management 128	
4.1 Key Figures 128	
4.2 After World War II 131	
5 Present Situations 132	
5.1 Malcolm Baldrige National Quality Award 132	
5.2 ISO 9001 2015 132	
5.3 Quality Function Deployment (QFD) 133	
5.4 Statistical Process Control (SPC) 135	
5.5 Quality Improvement (QI) Story 140	
5.6 Six Sigma 140	
5.7 Lean 141	
5.8 Lean Six Sigma 141	
5.9 Design for Manufacture and Assembly (DFMA) 142	
5.10 Quality Risk Management and Quality Recovery Plans 142	
5.11 Quality Management Themes 142	
5.12 Quality Culture 143	
6 Future Projections 143	
7 Further Research Directions 144	
References and Bibliography 145	
Facilities Design and Planning	147
Sunderesh S. Heragu and Ahmed Jamoussi	
1 Introduction 147	
2 Motivating Case Study 147	
3 Flow Patterns and Flow Process Charts 149	
3.1 Flow Patterns 149	
3.2 Flow Process Chart 149	
4 Facilities Layout 152	
4.1 Types of Layout 152	
4.2 Systematic Layout Planning 152	
4.3 Algorithms and Software for Layout Planning 153	
4.3.1 Layout Algorithms 153	
4.3.2 Software for Layout Design 153	
5 Materials Handling 155	
5.1 Types of Material Handling Devices 155	
5.2 Automated MHDs Used in a Shipping Port 156	
5.3 Ten Principles of Materials Handling 157	
6 Warehouse Design 158	
6.1 Warehouse Storage Policies 158	
7 Trends in Facilities Design 160	
7.1 Material Handling and Logistics US Roadmap: Trends 160	
7.1.1 F-Commerce 160	

	7.1.2 Competition among Third-Party Logistics Providers 161
	7.1.3 Mass Customization 161
	7.1.4 Urbanization 161
	7.1.5 Mobile and Wearable Computing 161
	7.1.6 Robotics and Automation 161
	7.1.7 Sensors and the Internet of Things 161
	7.1.8 Big Data and Predictive Analytics 162
	7.1.9 The Changing Workforce 162
	7.1.10 Sustainability 162
	7.2 Material Handling and Logistics US Roadmap: Capabilities by 2025 162
	7.2.1 Total Supply Chain Visibility 163
	7.2.2 Standardization 163
	7.2.3 High-Speed Delivery 163
	7.2.4 Low-Cost, Low-Impact Materials Handling and Logistics 163
	7.2.5 Planning and Optimization 164
	7.2.6 Impact of E-Commerce 164
	7.2.7 Collaboration 164
	7.3 Energy and Resource Efficient Manufacturing 164
	7.4 Leadership in Energy and Environmental Design 165
	7.5 Implications for Managers 165
	7.6 Directions for Future Research 166
	References and Bibliography 167
9	Manufacturing Strategy 169
9	Manufacturing Strategy Raffaella Capliano and Federico Caniato
9	Raffaella Cagliano and Federico Caniato
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171
9	 Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172
9	 Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173 4.1.1 World Class Manufacturing 173 4.1.2 Lean Production 173
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173 4.1.1 World Class Manufacturing 173 4.1.2 Lean Production 173 4.1.3 Strategically Flexible Production 173
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173 4.1.1 World Class Manufacturing 173 4.1.2 Lean Production 173 4.1.3 Strategically Flexible Production 173 4.1.4 Other Manufacturing Strategy Paradigms 173
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173 4.1.1 World Class Manufacturing 173 4.1.2 Lean Production 173 4.1.3 Strategically Flexible Production 173
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173 4.1.1 World Class Manufacturing 173 4.1.2 Lean Production 173 4.1.3 Strategically Flexible Production 173 4.1.4 Other Manufacturing Strategy Paradigms 173 4.1.5 Smart Manufacturing: The Emerging Manufacturing Paradigm 174 4.2 Manufacturing Paradigm Versus Strategic Choices: The Debate 174
9	Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173 4.1.1 World Class Manufacturing 173 4.1.2 Lean Production 173 4.1.3 Strategically Flexible Production 173 4.1.4 Other Manufacturing Strategy Paradigms 173 4.1.5 Smart Manufacturing: The Emerging Manufacturing Paradigm 174
9	 Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173 4.1.1 World Class Manufacturing 173 4.1.2 Lean Production 173 4.1.3 Strategically Flexible Production 173 4.1.4 Other Manufacturing Strategy Paradigms 173 4.1.5 Smart Manufacturing: The Emerging Manufacturing Paradigm 174 4.2 Manufacturing Paradigm Versus Strategic Choices: The Debate 174 5 The Strategic Goals of Manufacturing Operations 175
9	 Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173 4.1.1 World Class Manufacturing 173 4.1.2 Lean Production 173 4.1.3 Strategically Flexible Production 173 4.1.4 Other Manufacturing Strategy Paradigms 173 4.1.5 Smart Manufacturing: The Emerging Manufacturing Paradigm 174 4.2 Manufacturing Paradigm Versus Strategic Choices: The Debate 174 5 The Strategic Goals of Manufacturing Operations 175 5.1 Strategic Trade-Offs and Cumulative Capabilities 175
9	 Raffaella Cagliano and Federico Caniato 1 Introduction 169 2 The Strategic Role of Manufacturing Operations 170 3 Key Concepts in Manufacturing Strategy 171 3.1 Manufacturing Strategy Content 171 3.2 Manufacturing Strategy Process 172 4 Manufacturing Paradigms 172 4.1 The Most Relevant Manufacturing Paradigms 173 4.1.1 World Class Manufacturing 173 4.1.2 Lean Production 173 4.1.3 Strategically Flexible Production 173 4.1.4 Other Manufacturing Strategy Paradigms 173 4.1.5 Smart Manufacturing: The Emerging Manufacturing Paradigm 174 4.2 Manufacturing Paradigm Versus Strategic Choices: The Debate 174 5 The Strategic Goals of Manufacturing Operations 175 5.1 Strategic Trade-Offs and Cumulative Capabilities 175 5.1.1 The Trade-Off Model 176

	6	Manufacturing Decisions 177
	-	6.1 Manufacturing Decisions from a Contingency Perspective 178
		6.2 Manufacturing Improvement Programs and Best Practices 1/8
	7	Manufacturing Strategy and the Evolution of Technology 179
		7.1 Automation 180
		7.2 The Role of Information Technology 180
		7.3 Flexible Technologies 180
		7.4 Digital Technologies 180
		7.5 New Technologies 181
	8	Global Manufacturing Strategies 181
		8.1 Enablers and Drivers 181
		8.2 Plant Location 182
		8.3 Manufacturing Networks 182
		8.4 Recent Trends 183
	9	How to Research Manufacturing Strategy 183
		9.1 Large-Scale Surveys 183
		9.2 Limitations and Future Developments 184
	10	New Challenges for Manufacturing Strategy 184
	Re	ferences and Bibliography 185
PAR		
PO.	Μŀ	Process and Project Categories 195
10	Pro	ocess Capabilities and Leveraging Advances in Science and Technology 197
		eryl Gaimon, Manpreet Hora, and Karthik Ramachandran
		Introduction 197
		1.1 Process Capabilities and New Product Development 197
		1.2 Process Capabilities and Profitability 198
		1.3 Recent Advances in Process Capabilities 199
		1.4 Greenfield Versus Brownfield Change to Process Capabilities 199
		Managing Internal Knowledge to Develop Process Capabilities 200
		2.1 Integrating Product and Process Knowledge in a Single NPD Project 200
		2.2 Derivative and Radical NPD Projects 202
		2.2.1 A Radical NPD Project 202
		2.2.2 Funding Radical and Derivative NPD Projects 203
		2.3 Investments in Technical Support 203
	3	Managing External Knowledge to Develop Process Capabilities 204
		3.1 Alliances in a Supply Network 204
		3.2 Alliances with Competitors 204
		3.2.1 Trade-Offs in Coopetitive Development 205
		3.3 Acquiring Knowledge from Non-Competing Firms 205
	4	Future Opportunities for Research 206
		4.1 Leveraging Internal Knowledge 206

	 4.2 Leveraging External Knowledge 207 4.2.1 Alliances in a Supply Network 207 4.2.2 Alliances with Competitors 207 4.2.3 Acquiring Knowledge from a Non-Competing Firm 208 5 Implications for Practitioners 208 6 Conclusion 209 References and Bibliography 210 	
11	Project Design and Management Tyson R. Browning 1 Introduction 214 2 Looking Back at PM Research 215 2.1 Activity Scheduling 215 2.2 PM Tool Development 216 2.3 Organizational Coordination 216 2.4 Product Development (PD) and Innovation Management 217 2.5 Project Portfolio Management (PPM) 217 2.6 Other Empirical Research 218 2.7 Perspective 218	214
	3 Looking Around: The Current Situation in PM Research 219 3.1 Agile PM 220 3.2 Factors Distinguishing Different Types of Projects and PM Methods 3.3 People, Teams, Behaviors, and Knowledge Management 221 3.4 Outsourcing and Partnering with Other Organizations 221 3.5 Systems Views and Structural Models 222 3.6 Measuring Progress and Value 223 4 Looking Forward: Opportunities for Future PM Research 224 5 Implications for Managers 226 6 Conclusion 226 References and Bibliography 227	220
12	From Lean Production to Operational Excellence Pauline Found, Donna Samuel, and James Lyons 1 Introduction 234 2 Emergence of Lean Production 235 2.1 Toyota Production System (TPS) 235 2.2 Total Quality Management (TQM) 238 2.3 Total Productive Maintenance (TPM) 239 3 Evolution of Lean Production Research 239 3.1 Lean and the Interactions with Traditional Cost Accounting 242 3.2 Other Business Improvement Systems in OM 242 3.2.1 Six Sigma 243 3.2.2 Agile Manufacturing 243 3.2.3 Theory of Constraints (TOC) 244	234

	 4 Contemporary and Future Research in Lean Operations Management 244 4.1 Systems Thinking 245 4.2 Operational Excellence 245 5 Future Research Directions 247 6 Conclusions 247 References and Bibliography 248 	
	T IV terging Themes and New Research Domains of POM	253
13	Business Startup Operations Nitin Joglekar, Moren Lévesque, and Sinan Erzurumlu 1 Introduction 255 2 What We Know about Business Startup Operations 257 2.1 Review Articles 257 2.2 Findings in Recent Publications 258 3 Emergent Opportunities 264 3.1 New Digital Technologies 264 3.1.1 Connectivity Based Analytics 264 3.1.2 Low-Cost Intelligent Robotics 266 3.2 Business Model Innovations 266 3.3 Research Implications 267 3.3.1 Alignment between BMIs and OIs 267 3.3.2 Platform Economics 269 3.4 Managerial Implications 270 4 Conclusion 271 References and Bibliography 271	255
14	Sustainable Operations Tharanga K. Rajapakshe, Asoo J. Vakharia, Lan Wang, and Arda Yenipazarli 1 Introduction 276 1.1 Why Focus on Sustainability? 276 1.2 Operations/Supply Chain Management and Sustainability 277 1.2.1 Product/Process Design and Sustainability 277 1.2.2 Sustainability in Supply Chains 277 1.2.3 Environmental Legislations 277 1.3 Organization of This Chapter 278 2 Product Design and Process Development 278 2.1 Green Product Design and Environmental Performance 278 2.2 Why Don't Consumers Buy Green Products? 279 2.3 Innovation in Green Product Design 280 2.4 Green Product Offering Strategies 280	276

	3 Supply Chains 281
	3.1 Forward Supply Chains 281
	3.1.1 Product and Retail Competition 281
	3.1.2 Component Commonality and Remanufacturing 281
	3.1.3 Order Quantities and Customer Environmental Concerns 282
	3.2 Reverse Supply Chains 282
	3.2.1 Reverse Supply Chain Networks 282
	3.2.2 Managing the Collection Process 283
	3.2.3 Remanufacturing 283
	4 Environmental Legislation 284
	4.1 Life-Cycle Assessment and New Product Introduction 284
	4.2 Extended Producer Responsibility (EPR) 285
	4.3 Policy Implications 286
	5 Directions for Future Research 287
	References and Bibliography 288
15	The Interdependence of Data Analytics and Operations Management 293
	Kaushik Dutta, Abhijeet Ghoshal, and Subodha Kumar
	1 Introduction 291
	2 Retail Operations 291
	2.1 Design Aspects of Recommender Systems 292
	2.2 Future Research on Recommender Systems 292
	2.2.1 Algorithm Design 292
	2.2.2 Recommendations Considering Trade-Offs 293
	2.3 Economic and Supply Chain Problems on Recommender Systems 293
	2.3.1 Effect of Recommendations on the Overall Supply Chain 293
	2.3.2 Information Sharing within a Supply Chain 294 3 Mobile 294
	3.1 Existing Research on Using Data from Mobile Devices
	and Platforms 294
	3.1.1 Impact of Advertisements on Sales 295
	3.1.2 Location Determination of Users 295
	3.2 Future Research in the Space of Mobile Technology 295
	3.2.1 Operations of Mobile Phones 295
	3.2.2 Operations of Mobile Apps 296
	3.2.3 Operations of Mobile Network Service 296
	4 Online Advertising 296
	4.1 Advertisement Scheduling 297
	4.2 Real-Time Bidding Platforms 297
	4.2.1 The Ad Allocation Problem 297
	4.2.2 Audience Targeting in Mobile Apps 297

	4.2.3 Technology Challenges 298	
	4.2.4 Auctioning Strategies 298	
	4.2.5 Security and Privacy Research 298	
	5 Smart Cities 298	
	5.1 Existing Research on the Use of Big Data for City Planning 299	
	5.1.1 City Transportation 299	
	5.1.2 City Energy Needs 299	
	5.1.3 Law Enforcement 300	
	5.2 Future Research Directions for Smart Cities 300	
	5.2.1 Potential Applications in Disaster Management 300	
	6 Energy 301	
	6.1 Generation and Distribution of Energy 301	
	6.2 Energy Consumption 301	
	7 Healthcare 302	
	7.1 Existing Research in Healthcare 302	
	7.1.1 Healthcare and Information Technology 302	
	7.1.2 Device Manufacturing 303	
	7.1.3 Role of Online Communities in Healthcare 303	
	7.2 Potential Questions for Future Research 303	
	7.2.1 Healthcare Information Exchange 303	
	7.2.2 Privacy 303	
	7.2.3 Online Communities 304	
	7.2.4 Devices 304	
	8 Implications for Managers 304	
	9 Conclusions and Directions for Future Research 305	
	References and Bibliography 305	
16	The Evolution of Logistics Clusters	309
	Yossi Sheffi and Liliana Rivera	
	1 Introduction 309	
	2 Literature Review of Industrial Clusters 310	
	2.1 Increased Productivity and Innovation 310	
	2.2 Agglomeration Versus Dispersion 311	
	2.3 Logistics Clusters 311	
	3 Development of Logistics Clusters 312	
	4 Logistics Clusters BenefitsIntra-Cluster Collaboration 312	
	4.1 Transportation Capacity Sharing 312	
	4.2 Warehouse Capacity Sharing 313	
	4.3 Labor Sharing 313	
	4.4 Information Sharing 313	
	5 Logistics Clusters Benefits—Value-Added Services 314	
	5.1 Postponement and Customization 314	
	5.2 Retail Display Arrangement 315	

	5.3 Kitting 315	
	5.4 End-of-Runway Location 315	
	6 Logistics Clusters Benefits—Innovation 316	
	6.1 Environmental Innovation 316	
	6.2 Intra-Organizational Inter-Cluster Innovation Transfer 316	
	7 Logistics Clusters Benefits—Jobs 317	
	7.1 Blue- and White-Collar Jobs 317	
	7.2 Sub-Cluster Development and Jobs 317	
	7.3 Education and Training 318	
	7.4 Upward Mobility 318	
	8 The Future of Logistics Clusters 318	
	8.1 Factors Leading to Logistics Clusters Growth 319	
	8.2 Factors Leading to Possible Decline of Logistics Clusters 319	
	9 Implications for Practitioners and Policy Makers 320	
	9.1 Considerations of Site Selection 320	
	9.2 Globalization 320	
	9.3 Support for Cluster Development: Zoning, Connectivity, and Finance 32	21
	9.4 Regulations and Taxes 321	
	9.5 International Trade 321	
	10 Future Research Opportunities 322	
	References and Bibliography 323	
17	Human Behavior in Operations 32	26
	Elliot Bendoly, Adam McClintock, and Rahul Pandey	
	1 Introduction 326	
	2 A Brief Historical Overview 327	
	2.1 Early Rumbling of a Domain 327	
	2.2 The BeOps Renaissance 328	
	3 Contemporary Foundations from Aligned Domains 329	
	3.1 Cognitive Psychology 329	
	3.1.1 Common Biases 330	
	3.1.2 Established Heuristics 332	
	3.2 Group and Social Influences 333	
	3.3 System Dynamics and Systems Thinking 334	
	Designing for Behavior: Bridging OM Science and Practice 335	
	4.1 Anticipating Cuts and Pastes 335	
	4.1.1 Set Biases 336	
	4.1.2 Trend Biases 336	
	4.1.3 Casual Biases 337	
	Conclusions 337	
	5.1 Best Practices in Design for OM Tools 337	
	5.2 Implications for Practitioners 338	
	5.3 Directions for Future Research 339	
	References and Bibliography 340	

·	Interface with other American	
18	Management Accounting and Operations Management	345
	Thomas Hemmer and Eva Labro	
	1 Introduction 345	
	2 The Importance of Considering Incentives and Performance Measurement	
	in Optimizing Operations 346	
	2.1 Introduction to Performance Measurement and Incentives 346	
	2.1.1 Agency Theory 346	
	2.1.2 The Sufficient Statistic Condition 347	
	2.1.3 Implications for Operations Management 348	
	2.2 Throughput Maximization and Capacity Constraints 349	
	2.2.1 An Operations Management Perspective on Throughput	
	Maximization Under Capacity Constraints 349	
	2.2.2 A Management Accounting Perspective on Throughput	
	Maximization Under Capacity Constraints 350	
	2.2.3 Alternate Solutions Proposed by the Management	
	Accounting Perspective 351	
	2.2.3.1 Profit Sharing 351	
	2.2.3.2 Performance Measurement and the Balanced Scorecard	351
	2.3 Push Versus Pull Production 352	
	2.3.1 An Operations Management Perspective on Push Versus	
	Pull Production 352	
	2.3.2 A Management Accounting Perspective on Push Versus	
	Pull Production 352	
	2.3.2.1 Incentives Under the Push System 352	
	2.3.2.2 Incentives Under the Pull System 353	
	2.3.2.3 A Measure of Intermediate Product Quality 353	
	2.4 Implications for Practice 354	
	3 The Importance of Considering Operations When Designing Cost	
	Measurement Systems 354	
	3.1 The Mechanics of Cost Measurement 354	
	3.1.1 Traditional Costing Methods 354	
	3.1.2 Activity-Based Costing 355	
	3.1.3 Time-Driven Activity-Based Costing 355	
	3.2 Operations Management Choices Affecting Cost Measurement Accuracy	356
	3.2.1 Validity of the ABC Hierarchy 356	
	3.2.2 Cost of Product Variety 356	
	3.3 Implications for Practice 357	
	4 Directions for Future Research 358	
	4.1 Service Sector Considerations 358	

4.2 Accounting Information Technology Advances 3584.3 Dynamic Cost Measurement in Specific Operations Environments 358References and Bibliography 359

John	oM and Finance n R. Birge ntroduction 360	360
2 I 3 I	mpact of Financing Needs on Single Firm Operational Decisions 361 mpact of Financial Markets on Single Firm Operational Decisions 362	
5 I:	mpact of Financial Considerations on Supply Chain Operations 367 mpact of Operational Decisions on Financial Asset Prices 368	
6 E	Empirical Results in Operations and Finance Interactions 368	
	Conclusions and Future Research Directions 370 erences and Bibliography 370	
TCI	etences and bibliography 370	
20 PO	M and Marketing	374
	noj K. Malhotra, Ramkumar Janakiraman, Saurabh Mishra, and Moonwon Chung	
	ntroduction 374	
	nput Context-Multichannel Retailing as a Challenge to Customer	
	egmentation, Inventory Management, and Reverse Logistics 375 2.1 Complex Market Segments 376	
	2.2 Increased Inventory Volatility 377	
	2.3 Returned and Remanufactured Products 377	
3 P	rocess Coordination: Intra-/Inter-Firm Issues in POM and	
Ν	Marketing Interface 378	
3	.1 Focus on Micro-Level Process Integration with Data	
	Rich Forecasting 378	
	.2 Joint Capability Planning 379	
	.3 Reverse Logistics and Sustainability 380	
	Output Consequence: Complementarity Between POM and Marketing or Building Shareholder Wealth 381	
	.1 Theoretical Frameworks for Research on Shareholder Wealth 381	
	.2 Current Research on Shareholder Wealth in POM	
	and Marketing 382	
5 F	uture POM and Marketing Interface Research Avenues 383	
5.	.1 Deepening Consumer Knowledge and Channel Dynamics	
_	Across Channels 383	
5.	2 Designing Better Socially Responsible and Environmentally	
E	Sustainable Processes in POM and Marketing 385 3 Fostering Complementarity Between POM and Marketing Capabilities	206
	uplications for Practitioners 386	360
	Conclusion and Future Research Directions 387	
	rences and Bibliography 387	
04 mm	C D. I. CIV. D	202
	Strategic Role of Human Resources in Enabling POM	392
	rt K. Prescott, Henrique L. Correa, and Adeola O. Shabiyi htroduction 392	
	1 Purpose of the Chapter 392	

1.2 Background 392

- 2 A Call for Synergy Between Human Resources and Production and Operations Management 393
 - 2.1 A Strategic Imperative—Review of the Literature 393
 - 2.2 Current Trends in Human Resources Management (HRM) 394
 - 2.2.1 Human Capital Research and Analytics 394
 - 2.2.2 Integrating HR Practices with POM 394
 - 2.2.3 Organizational Development (OD) and Human Resources (HR) in Production and Operations Management (POM) 394
 - 2.3 Best Practices in Human Resources Management (HRM) 395
 - 2.3.1 Internal HR Professionals and POM 395
 - 2.3.2 Human Resources (HR) and the Organizational Performance Linkage 396
 - 2.3.3 The HR-Performance Linkage and Geographic Implications 396
 - 2.3.4 The HR-Performance Linkage and Learning 397
 - 2.4 Current Issues in Production and Operations Management (POM) 397
 - 2.4.1 Human Resources (HR) and Production and Operations Management (POM) Research 397
 - 2.4.2 HR and Operations Practices and Organizational Performance 399
 - 2.4.3 Group Social Dynamics and Performance 399
 - 2.4.4 Cross-Functional Coordination, Information Systems Capability, and Performance 399
 - 2.4.5 Systems Thinking and Performance 400
- 3 Professional Perspective 400
 - 3.1 Explanatory Survey with HR and POM Leaders—"A Synthesis of Needs" 400
 - 3.2 Results 401
 - 3.2.1 How Is the Overall Role of SHRM Evaluated by Industry Production and Operations Leaders and Managers? 401
 - 3.2.2 How Is the Partnership Role of SHRM with POM Evaluated by Industry Human Resources Leaders and Managers? 401
 - 3.2.3 What Is the Contemporary Role of SHRM in POM? 402
 - 3.2.4 How Can SHRM Enable POM? 402
 - 3.3 Survey Conclusions 402
 - 3.3.1 HR and POM Partnership 402
 - 3.3.2 HR and POM Best Practices 403
 - 3.3.3 HR as a Change Agent 404
- 4 HR Enabling POM to Win the Talent War 404
- 5 Implications for Managers 407
- 6 Recommendations for Future Research 407
- 7 Conclusions 408

References and Bibliography 408

PART VI		
P	OM Domains of Application	411
	Operations Management in Hospitality Rohit Verma, Lu Kong, and Zhen Lin 1 Introduction 413 2 The Essence of Hospitality 414 3 Product and Service Innovation in Hospitality 414 4 Integrating Service Quality in Operational Processes 415 5 The Role of Employees 415 6 Demand and Capacity Management 416 7 Yield and Revenue Management 416 8 Ownership Structure, Franchising, and Cost of Operations 417 9 Start-Up of New Locations and Managing Hospitality Projects 418 10 Managing Risk and Disruption 419 11 Role of Lean Thinking and Sustainable Operations in Hospitality 420 12 The Role of New Media in Managing Hospitality Operations 420 13 Directions for Future Research 421 References and Bibliography 423	413
23	POM for Healthcare—Focusing on the Upstream: Management of Preventive and Emergency Care Vedat Verter 1 Introduction 427 2 POM for Preventive Care 430 2.1 Preventive Care Processes 430 2.2 A Basic Formulation for Designing Preventive Care Networks 431 2.3 Extended Models for Preventive Care 432 3 POM for Emergency Care 433 3.1 Key Challenges in ED Management 434 3.2 Simulation of ED Processes 435 3.3 A Case Study in ED Triage 436 4 Implications for Managers 439 5 Conclusions and Future Research Directions 440 References and Bibliography 440	427
24	Sports Operations Management: The Whole Nine Yards David Bamford, Benjamin Dehe, Iain Reid, James Bamford, and Marina Papalexi 1 Introduction 443 2 Past History 443	443

	3 Present Situation 450	
	3.1 Design of Sports Operations 451	
	3.2 Planning and Control of Sports Operations 452	
	3.3 Improvement of Operations 453	
	3.4 Data in Sports 455	
	4 Future Projections and Opportunities 456	
	4.1 Key Performance Indicators 458	
	4.2 Implications for Practitioners 459	
	5 Conclusions 460	
	References and Bibliography 460	
25	POM in Agriculture: Pastoral Farming in New Zealand	467
_~	David Gray and Nicola M. Shadbolt	
	1 Introduction 467	
	2 Normative Versus Descriptive Research 467	
	3 Tactical Management Process 468	
	3.1 The Planning Process 470	
	3.1.1 Informal Planning Process 470	
	3.1.2 Formal Planning Process 472	
	4 The Plan 475	
	4.1 The Predictive Planning Schedule 477	
	4.2 Targets 478	
	4.3 Contingency Plans 479	
	5 The Control Process 480	
	5.1 Monitoring 482	
	5.1.1 The Factors that are Monitored 482	
	5.1.2 Monitoring Methods 483	
	5.1.2 The Role of Information from the Monitoring Process 484	
	5.1.4 Activation, Termination, and Frequency of Monitoring 485	
	5.2 Decision Point Recognition 486	
	5.3 Diagnosis 487	
	5.4 Limits to Control and the Environment 489	
	5.5 Control Responses 491	
	6 Implications for Practitioners 492	
	7 Conclusion 492	
	References and Bibliography 493	
	references and biologiaphy 493	
26	POM and the Military	407
	Keenan D. Yoho and Wayne P. Hughes Jr.	497
	1 Introduction: Differentiating the Improvement CA 1. C.	
	1 Introduction: Differentiating the Improvement of Arsenals from the	
	Application of Weapons, Strategy, and Tactics in War 497	
	1.1 Differentiating the Character of Operations Management in the	
	Civilian and Military Contexts 497	

	2 Past History 498	
	2.1 Bringing Advances in Military Operational Research to Civilian	
	Operations Management 500	
	3 Present Situation 501	
	3.1 The Problems of Search, Optimization, and Exchange 501	
	4 Future Projections as the Character of Conflict Changes 502	
	4.1 High-End Warfare 503	
	4.2 Warfare with Non-State Actors 503	
	5 Implications for Managers 504	
	6 Directions for Future Research 505	
	References and Bibliography 505	
27	Not-for-Profit Operations Management	510
	Qi Feng and J. George Shanthikumar	
	1 Introduction 510	
	2 Fundraising for Not-for-Profit Operations 511	
	2.1 Funding Instability and Prediction 512	
	2.2 Funding Restrictions and Contingencies 513	
	3 Revenue Management and Pricing 514	
	4 Resource Management 515	
	5 Distribution of Product and Service 517	
	5.1 The Choice of Product or Service Offering 517	
	5.2 The Supply Process and Inventory Management 518	
	5.3 Allocation and Consumer Behavior 520	
	6 Performance Evaluation 520	
	7 Implications for Managers 521	
	8 Directions for Future Research 521	
	References and Bibliography 522	
28	Telecommunications and Operations Management	527
	Subodha Kumar, Kaushik Dutta, and Yonghua Ji	
	1 Introduction 527	
	2 Network Infrastructure 527	
	2.1 Network Design and Interconnection 527	
	2.2 Capacity Planning 528	
	2.3 Capacity Allocation and Sharing 529	
	2.4 Network Security Design 530	
	2.5 Network Risk Management 530	
	2.6 Future Research 531	
	3 Network Operations 531	
	3.1 Operations Management of Caching 531	
	3.2 Content Delivery Network 533	
	3.2.1 Content Distribution and Request Routing 533	
	3.2.2 Allocation of Capacity 533	

	3.2.3 Capacity Pricing 534	
	3.2.4 Future Research 534	
	3.3 Operations Management of Cloud Computing 534	
	3.3.1 Job Scheduling in the Cloud 534	
	3.3.2 Resource Optimization in the Cloud 535	
	3.3.3 Future Research 535	
4	Applications of Telecommunications in Operations 536	
	4.1 Humanitarian Operations 536	
	4.1.1 Online Education 536	
	4.1.2 Disaster Recovery and Rescue Operations 536	
	4.1.3 Further Research 537	
	4.2 Healthcare Operations 537	
	4.2.1 Tele-Medicine 537	
	4.2.2 Health Information Exchanges (HIEs) 537	
	4.2.3 Future Research 538	
	4.3 Homeland Security Applications 538	
	4.3.1 Further Research 538	
	Implications for Managers 539	
	Conclusions and Directions for Future Research 539	
R	eferences and Bibliography 539	
Б.		
	OM for Disaster Management	543
	eter W. Robertson, Sushil K. Gupta, and Martin K. Starr	
	Introduction 543	
	Context 543	
3	Compelling Case for the Achievement of Disaster Management	
4	Excellence in POM 544	
	Past History 547	
5	Present Situation 548	
	5.1 Explanation of Figure 29.1—Disaster Management Cycle 548	
	5.2 Present DM Taxonomies 548	
,	5.3 Present DM Typologies 550	
	Future Projections 551	
/	Disaster Management Research 553	
	Implications for Managers 555	
	Future Research Directions 555	
K	eferences and Bibliography 556	
т	The Improve of DOM . The	
L	The Impact of POM on Transport and Logistics	557
	Dongping Song	
	Introduction 557	
ے	Transport Modes and Features 558	
	2.1 Road Transport 558	
	2.2 Rail Transport 558	

	2.3 Air Transport 559	
	2.4 Water (Maritime) Transport 559	
	2.5 Pipeline Transport 559	
	2.6 Comparison of Transport Modes 559	
	3 Transport Systems and Key Performance Indicators (KPIs) 560	
	3.1 Transport Systems 560	
	3.2 KPIs 561	
	4 POM Research in Transport and Logistics 561	
	4.1 Service Network Design 562	
	4.1.1 Solution Techniques 563	
	4.2 Fleet Sizing and Deployment 564	
	4.3 Vehicle/Inventory Routing and Scheduling 565	
	4.3.1 Vehicle Routing Problem (VRP) 565	
	4.3.2 Inventory Routing Problem 566	
	4.3.3 Cargo Routing Problem 566	
	4.3.4 Schedule Design Problem 566	
	4.4 Speed Management and Slow Streaming 567	
	4.5 Empty Vehicle/Container Management 567	
	4.5.1 Empty Vehicle Management 568	
	4.5.2 Empty Container Management 568	
	4.6 Disruption Management 568	
	4.7 Crew Scheduling and Rostering 569	
	4.8 Port/Terminal Management 570	
	4.9 Emission Management 571	
	5 Implications for Managers 572	
	6 Directions for Future Research 572	
	6.1 General POM Modelling Opportunities 572	
	6.1.1 Objective Functions and Constraints 572	
	6.1.2 Decision Integration 573	
	6.1.3 Stochastic and Dynamic Operations 573	
	6.1.4 Solution Techniques and Heuristic Rules 573	
	6.2 Emerging ICT-Driven Opportunities 574	
	References and Bibliography 574	
31	POM and Retailing	579
	Vishal Gaur	
	1 Introduction 579	
	2 A Historical Perspective of Research in Retail Operations 580	
	2.1 Inventory Management 580	
	2.2 Retail Supply Chains 582	
	2.3 Customer Service 583	
	2.4 Pricing and Clearance Markdowns 583	
	2.5 Shelf Space Management 584	

		2.6 Assortment Planning 584	
		2.7 Financial Performance of Retailing Firms 585	
		Present Situation 586	
		3.1 Store Execution and Workforce Management 587	
		3.2 Online and Omnichannel Retailing 587	
	4	Directions for Future Research 588	
		4.1 Availability of Individual Customer-Level High-Frequency Data	
		Will Drive Research in New Decision Models and Experiments 589	
		4.2 New In-Store Technologies Will Transform Retail Stores, Making	
		Bricks and Clicks a Reality and Changing the Customer Experience 589	
		4.3 Emerging Retail Formats, Warehouse Logistics, and Package Delivery	
		Methods Will Create More Opportunities for Research 590	`
		4.4 Environmental Sustainability Will Grow as a Research Area in Retailing 590	,
		4.5 Merchandising and Sourcing Functions Will See Research in	
	_	New Models 591	
		implications for Practitioners 591	
		Conclusions 592	
	Re	ferences and Bibliography 592	
PAR			
Exp	er	POM Practitioners' Perspectives 59	99
32	PC	M for the Hospitality Industry 60	01
	Le	c Cockerell	
	1	POM for the Hospitality Industry 601	
	2	Mapping Customer Service—Managing Systems and Processes 601	
		Management Is About Control 601	
	4	Management Titles and POM Methods in the Hospitality Industry 602	
	5	Walt Disney World® Principles for Success 602	
		5.1 Chain of Excellence at Walt Disney World® 603	
	6	Great Leader Strategies at Walt Disney World® 603	
	/	The Disney World Purpose Statement 604	
	8	Creating Disney World Magic 604	
	10	Eliminate Hassles (Policies, Procedures, and Operating Guidelines) 604	
		Stay Ahead of the Pack 605	
		The Four Keys Model 606	
	1 4	Learn to Tell a Good Story 606	
		12.1 "Be Safe, Not Sorry!—Focused Attention Creates Positive Results" 60	7
		Quanty over Quantity Quality Always Wins Out!" 607	
		12.5 Wessy and Not Clean Look the Same to Guests/Customers" 607	
		12.4 "9/11 Was the Saddest and Proudest Day of My Career" 608 12.5 "How to Take the Wind Out of Hurrisones" 609	
		12.0 LOW to Lake the Wind Chit of Harman and 27 Con	

	13 The Concept of POM: Find the Best Way to Do Everything and Then Do It That Way 609	
	References and Bibliography 610	
33	Trends in Global Sourcing, Procurement, and Distribution Research and Practice Edwin Keh 1 Global Trade's Role and Influence on Historical Developments 611 2 The Modern Era of Global Trade 612 3 Large-Scale Migration and Contract Manufacturing 613 4 The Forces Influencing the New Global Trade—An Inflection Point 613 5 Pollution and Other Costs to Consuming and Manufacturing 614 6 New Consumption Models and the Complex Cycles of Global Sourcing 615 7 Global Sourcing 616 8 Procurement 617	611
	9 Costing 620 10 Building Relationships Rather Than Making Transactions 621 11 The Challenges of Distribution 622 12 The Opportunities Ahead 622 13 Effective Global Supply Chain Operations—A Product and Process Characteristics-Based Decision-Making Framework 623 13.1 Product Characteristics 624 13.2 Manufacturing Process Characteristics 624 14 Implications for Future Research 630 References and Bibliography 630	
34	Best Practice: Supply Chain Optimization at Yihaodian Gang Yu and Ping (David) Yang 1 Introduction 632 2 Company Overview 632 3 Industry Landscape and YHD's Supply Chain Strategy 633 4 Supply Chain Models and YHD's Innovation 634 4.1 Supplier Logistics Center (SLC) 635 4.2 Pallet Pooling Service 637 4.3 Aggregated Supplier Delivery 639 4.4 Cross-Docking Logistics (CDL) 640 5 Performance Improvements 641 6 Future Development 641 6.1 Collaborative Planning, Forecast, and Replenishment (CPFR) 642 6.2 Data-Driven Supply Chain Management 642	632
	References and Bibliography 644	

35	The Evolutionary Trends of POM Research in Manufacturing

Tinglong Dai and Sridhar Tayur

- 1 Introduction: Creating Wealth and Happiness, Massively 647
- 2 Modern Manufacturing: An Orchestration of Technologies 649
- 3 What Is Orchestrating Technology? 649
- 4 Operational Innovations and PPOMs 650
 - 4.1 POM Inside the Factory 652
 - 4.2 POM Outside the Factory 654
 - 4.3 Interface Between the Inside and the Outside of the Factory 655
- 5 Capital Versus Labor 657
- 6 Implications for Managers 658
- 7 Conclusion: The Future of POM and Manufacturing 659

References and Bibliography 660

36 Future Trends for Research and Practice in the Management of Global Supply Chains 663

Henrique L. Correa

- 1 Introduction 663
 - 1.1 Increase in Volatility 663
 - 1.2 Increase in Complexity 664
 - 1.3 Increase in the Influence of Organized Society and Governments to Make Organizations Pursue the Triple Bottom Line (3BL) 664
- 2 Implication of the Identified Trends for Practitioners 665
 - 2.1 Competencies to Deal with the Rise in Supply Chain Volatility 665
 - 2.2 Competencies to Deal with the Increase in Supply Chain Complexity 666
 - 2.2.1 The Use of Postponement 666
 - 2.2.2 Integration of Decision-Making Processes and Increased Collaboration 666
 - 2.2.3 The Use of New Technologies 667
 - 2.2.4 Segmentation of Supply Chains 667
 - 2.3 Competencies to Deal with the Increase in Pressure for 3BL 668
- 3 Directions for Research in Supply Chain Management 669
 - 3.1 Supporting Theories 669
 - 3.2 Proposed Research Directions in Supply Chain Management 670
 - 3.2.1 Future Research Related to Increased Volatility 670
 - 3.2.2 Future Research Related to Increased Complexity 671
 - 3.2.3 Future Research Related to Increased 3BL Performance 672
- 4 Conclusion 672

References and Bibliography 673

37	Conclusions: Evaluation and Prognostications for the POM Domain
	Sushil K. Gupta, Martin K. Starr, and Aleda Roth
	1 Summing Up the Accomplishments 676
	2 Reflections on the New Service Economy 677
	3 TRP—The Three Legs of the POM Stool 679
	3.1 POM Teaching and Learning 679
	3.1.1 POM in Business Schools 680
	3.1.2 Curriculum 680
	3.1.3 Teaching Materials 681
	3.1.4 Technology and Online 682
	3.1.5 Systems Approach/Interdisciplinary Teaching 683
	3.1.6 Experiential Learning 683
	3.2 Research and Modeling 684
	3.2.1 Models and Methodology 684
	3.2.2 Interdisciplinary Research 685
	3.2.3 Research Domains 686
	3.2.4 Publications Outlet 686
	3.3 New POM Practice Domains 686
	3.3.1 Emerging Application Areas 686
	3.3.2 Geographical Expansion 687
	3.3.3 POM and the Public Sector 687
	3.3.3.1 Regarding the First POM Interpretation 687
	3.3.3.2 Regarding the Second POM Interpretation 688
	4 Conclusions 688
	1 Concidions 000

Index 693

References and Bibliography 689 Appendix 691