

Index

A

action learning 212, 213, 214, 215, 216, 217, 218, 220, 224, 225, 226, 228
 action planning 214
 action research (AR) 215, 225
 action taking 214
 adoption paths 54
 adult learning 217, 228
 advance sales 326, 327, 329, 330, 333, 334, 335, 336
 all-unit wholesale quantity discount-subsidy mechanism 1, 2, 3, 4, 6, 10
 American Production and Inventory Control Society (APICS) 139
 analytical approaches 336
 analytic hierarchy process (AHP) 65, 66, 74, 75, 76, 78, 84, 85, 89
 arbitrary stochastic elements 165
 associated costs 242
 asymmetric consequences 35
 Auto-ID Center 56

B

backorders 154, 155, 156, 160
 Banker, Charnes, and Cooper (BCC) model 66
 base stock levels 129, 130, 131, 132, 133, 134, 135, 136
 Beer Game, the 141, 142, 150
 bifurcation analyses 35
 blood packets 327
 book reviews 16
 business environments 33
 business performance 141
 buy back contracts 127, 129, 135, 136
 buyers and suppliers 242

C

C++ 79
 capacity issues 16
 cellular automata simulation models 96
 Chance-Constrained Data Envelopment Analysis (CCDEA) 66
 channel coordination 2, 3, 11
 Charnes, Cooper, and Rhodes (CCR) model 66
 collaborative planning 109
 collaborative systems 154
 commercial simulation software 165
 commercial software 165
 commercial software solutions 165
 communication module 296, 298
 competitive advantages 15, 26
 competitive business strategies 290
 completed enumeration (CE) 173, 174, 175, 177
 computer-assisted tools 244
 conceptual models 231, 232, 233, 236, 237
 confidence intervals (CFI) 167
 confidentiality, integrity, and availability (CIA) 200, 201, 204
 confidentiality, integrity, availability and accountability (CIAA) 197, 202, 205, 206, 209, 210
 consumer demand 213
 contemporary business environments 33
 continuous monitoring systems 249
 continuous replenishment program (CRP) 109, 110
 control theory 33, 35, 37
 cooperative supply chains 153
 coordination mechanisms 1, 2, 3, 5, 7, 9, 10, 294

core business functions 181
 Council of Scientific and Industrial Research (CSIR) 336
 CPLEX 275, 276, 278, 279, 280, 285, 286, 288
 C-sharp 79
 customer service 241, 243, 244, 246, 276, 278
 cycle times 156, 158

D

data classifications 181, 190
 data envelopment analysis (DEA) 65, 66, 67, 69, 73, 74
 data exchange 182
 data protection 181
 decision making strategies 47
 decision making units (DMU) 66, 67, 68, 69, 70, 71
 decision tools 181
 Dell 94, 140, 149
 demand disruption 1, 2, 3, 5, 7, 8, 10
 denial of service (DoS) 200, 204
 Describe, Explain and Indicate (D.E.I.) 215
 desired safety stock 45
 desired stock levels 47
 deviation costs 1, 2, 5, 10
 direct material shortages 315
 DisAgent 113
 discounted cash flow (DCF) 328
 discount pricing schedules 72
 dispatch planning 311
 disruption management 2, 5
 disruptive innovations 54
 disruptive technologies 54, 55, 61
 distribution centers 153
 distribution cycles 156
 distribution lead times 315
 distribution planning 82
 dyadic relationships 234
 dyadic supply chains 126
 dynamic environments 217
 dynamic game models 1, 2
 dynamic natures 181, 189
 dynamic temporal relations 213

E

earthquakes 16, 21
 e-business applications 290, 291, 307
 e-businesses 290, 291, 292, 293, 294, 300, 304, 307, 308, 309
 e-business products 293
 e-collaboration 34
 e-collaboration tools 34
 e-commerce 141, 291, 292, 294, 304, 307, 309
 e-commerce applications 292, 294, 307
 economic lot sizing and scheduling problem (ELSP) 154, 160, 161
 economic order quantity (EOQ) 111, 153, 328, 337, 338
 editorial notes 16
 efficient consumer response (ECR) 109, 124
 electronic toll collection 55
 empirical studies 231
 engineer-to-order 82
 enterprise management 93
 enterprise resource planning (ERP) 34, 79, 80, 91, 109, 235
 e-retailers 96, 107
 European IT excellence award 79
 Event Tree Analysis (ETA) 21
 extensible markup language (XML) 293, 296, 298, 303, 306

F

failure mode and effect analysis (FMEA) 21
 fashion garments 326, 327, 329
 Fault Tree Analysis (FTA) 21
 financial markets 213
 finished products 76
 First In First Out (FIFO) 143, 146, 147, 297
 fix unitary price 134, 135
 food items 327
 forced compliance 128, 136
 fruit items 327
 fuzzy sets 72

G

game theory 1
 Genetic Algorithm Distribution Inventory Model (GADIM) 276, 278, 279, 281, 282, 283, 286, 288

Index

genetic algorithms (GA) 165, 166, 168, 172, 173, 174, 175, 176, 177, 178, 179, 275, 276, 277, 278, 279, 282, 283, 286, 287, 288
geometric Brownian process 93, 94, 97, 98, 104
global competitive markets 212
global distribution supply chains 108, 112, 123
globalization 198, 199
global supply chains 315
goal programming (GP) 65, 66

H

HP 94
HTTP protocols 293
human intervention 292

I

imprecise data 64, 66, 67, 72, 73
imprecise data envelopment analysis (IDEA) 67, 73, 74
inbound risks 20
industrial settings 326
industry practitioners 212
industry sectors 15, 17, 19, 23
industry standards 55
Information and Communication Technologies (ICT) 33
information flows 231, 234
information processing 230, 232, 233, 235, 236, 237
information risk management 181, 184
information risks 181, 182, 183, 184, 185, 194, 195
information sharing 230, 231, 232, 233, 234, 236, 237, 239, 240, 243, 252
information-sharing activities 230, 231, 232, 233, 234, 235, 236, 237
integer programming models 244, 247, 250
interaction protocols 296, 308
international marketplaces 199
Internet PC sellers 139, 141
intrusion detection system (IDS) 201
inventory control 140, 141, 142, 150, 152
inventory cost 280

inventory holding costs 126, 129, 131, 132, 133, 134, 135, 136, 137, 257
inventory holding socks 135
inventory levels 97
inventory models 326, 336
inventory problems 16
inventory systems 153, 155
IS compatibility 235, 236
IT applications 310, 312, 315, 316, 318, 323
IT infrastructures 61
IT security problems 199

J

joint economic lot sizing (JELS) model 154
Just-in-Time (JIT) 310, 325

L

labor overtime 5
linear, interactive, and discrete optimizer (LINDO) 275, 276, 278, 279, 280, 285, 286, 287
linear stepwise structures 254, 268
line searches 165, 168, 179
LINGO 247
logistic chains 95
longest processing time (LPT) 143, 146, 147

M

machine uptime 315
major modeling approaches 243
make-to-order environments 141
management microworlds 33
management policies 140
manufacturer-supplier 140
manufacturing performance 315, 324
manufacturing plant 280
manufacturing resource planning (MRP) 34, 35
manufacturing resource planning (MRP) systems 34
market demand 1, 3, 4, 5, 6, 10
marketing strategies 327
market representatives 311
MASCOT 111, 125
master production schedule (MPS) 215, 220, 221, 222, 223, 224, 225, 226, 227

material suppliers 181
 mathematical models 153, 160, 241, 330
 mathematical programs 244
 McDonald's 140
 microworlds 35, 48, 53
 MIT 111
 mixed integer programming models 244
 MS Excel 100
 multi-agent systems (MAS) 292, 297
 multi-channel supply chain systems 256
 multi-criteria problems 71
 multi-driver models 197
 multi-objective programming (MOP) 65

N

network design 286
 new technologies 182
 New Zealand 54, 55, 58, 59, 61
 non-linear dynamics analyses 35
 non-uniform step size gains 179

O

objective functions 154, 156, 158, 159, 165
 one-supplier-and-one-buyer chains 256
 operational efficiencies 181
 operational planning 316
 operation systems 243
 optimal inventory quantity 259, 260, 265, 266
 optimal management 276
 optimal policy 326, 333, 335
 optimal routing 280
 optimal warehouse stock 280
 optimization models 156, 258, 259, 261, 263, 265, 267
 optimization packages 165
 optimized production levels 275, 279
 Oracle 78, 79, 80, 81, 84, 85, 86, 87, 88
 order batching 231
 order-up-to-R policy 277
 ordinal optimization (OO) 165, 166, 167, 179

P

paper industry 311, 316
 paper machines (PM) 311
 paper mills 311, 315

peer-to-peer 293
 perishable items 326, 327, 328, 329, 336, 337
 physical exchanges 126
 physical flows 276
 PILOT models 244
 point-of-consumption 181
 point-of-origin 181
 price contracts 128, 129, 131, 132, 133, 134, 136
 price-service competition 2
 price-service decisions 2, 3, 10
 pricing policies 326, 327, 333, 338
 pricing schemes 126, 131
 proactive mode of interaction 293
 probabilistic security models 197
 Procter & Gamble (P&G) 140
 production costs 3, 12
 production cycles 156, 158
 project management (PM) 79
 proposed models 241

Q

quantitative models 213
 quantity flexibility 128, 129, 131, 133, 134, 135, 136, 138

R

radio frequency identification (RFID) 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 77, 80, 141, 150, 151, 152
 radio frequency identification (RFID) applications 55
 radio frequency identification (RFID) technologies 54, 55, 57
 railroad car tracking 55
 raw materials 15, 181, 191, 275, 279
 real-life data 104
 real world systems 165
 regional distributors 181
 replenishment points 244, 247, 250, 251
 replenishment policies 153
 required quantity (RQ) 112, 113, 115, 116, 117
 research-and-design project groups 232
 Resource Description Framework (RDF) 298, 303, 305, 306
 retail prices 256

Index

revenue models 256
revenue-sharing (RS) 254, 255, 256, 257, 259,
260, 261, 262, 263, 264, 265, 266, 267,
268, 272
revenue-sharing (RS) contracts 254, 255, 256,
257, 259, 260, 261, 262, 263, 267, 268
reverse logistics 72, 73
RFID for the supply chain (RFID/SC) 54, 55,
56, 57, 58, 61, 62
risk analysis 181, 182, 183, 184, 185, 188, 190,
192, 193, 195
risk management 181, 182, 184, 185, 193, 194,
195, 212, 225, 226, 228, 229
risk mitigations 213

S

safety-stock inventory 243, 246
safety stock planning 82
safety stocks 241, 244, 246, 247, 250
sales cycles 326, 329
scheduling coordination problems 95
security goals 197, 201, 202, 204, 210
security management 181
security risks 20
Semi-Markov chain models 197
sequential optimization mechanisms 254
sequential optimization models 258, 261, 263,
267
service costs 1, 2, 3, 4, 7, 8, 9, 10
service-oriented architecture (SOA) 79
setup costs 5, 6, 156
shelf life 327
shortage costs 97, 99
shortest processing time (SPT) 143, 144, 145,
146, 147, 148, 149
short-life-cycle products 256
simulated annealing (SA) 166, 175
simulation modeling 141
simulation models 96, 97, 98, 104
simulation optimization 165, 166, 179
simulation optimization algorithms 165
Simultaneous Perturbation Stochastic Approximation (SPSA) 165, 166, 167, 168, 169,
170, 171, 172, 173, 174, 175, 176, 177,
178, 179, 180
single information processors 230, 231, 236

software agents 292
Special Assistance Program (SAP) 336
spot sales 326, 327, 329, 333, 334, 335, 336
steady-state securities 197, 206
step-wise inventory holding costs 268
stochastic data 72
stochastic environments 153
stochastic models 197, 202
stockpiles 244
structural complexity 233, 234, 237
supplier networks 310
supplier reputation (SR) 70
supplier selection 64, 65, 66, 67, 69, 70, 71,
72, 73, 74
suppliers rankings 72
supplier teamwork 77
supply-chain analyses 35
supply-chain characteristics 231, 232, 233
supply chain coordination 128, 137
supply chain coordination management 2
supply chain coordination models 95
supply chain distribution inventory manage-
ment 279
supply chain dynamics 215, 216, 217
supply-chain information-processing 235, 236,
237
supply chain integration 141
supply chain management (SCM) 1, 10, 20,
34, 55, 56, 57, 60, 63, 72, 76, 77, 78, 79,
80, 81, 82, 83, 84, 85, 87, 88, 89, 90, 91,
109, 113, 117, 118, 119, 140, 151, 181,
197, 198, 199, 200, 201, 202, 203, 205,
206, 208, 209, 210, 212, 218, 230, 231,
233, 234, 236, 237, 277, 278
supply chain management (SCM) systems 197,
198, 199, 206, 208, 209
supply-chain members 230, 231, 232, 234,
235, 236
supply chain operations 213, 217, 219, 220,
222, 225, 227
supply chain operations reference (SCOR)
244, 251
supply chain optimization 179
supply chain partners 256, 257
supply-chain performance 231, 232, 233, 235,
236, 237, 240

supply chain phases 310, 313, 319, 322, 324
 supply-chain planning 286
 supply chain planning software 95
 supply chain risk management (SCRM) 15, 16,
 17, 19, 20, 21, 22, 23, 26, 28, 29, 30, 31,
 212, 213, 215, 218, 221, 222, 224, 228,
 229
 supply chains 1-12, 15-37, 39, 42, 43, 48, 49,
 50, 54-61, 64, 72, 74, 76, 77, 78, 80,
 81, 82, 85, 88, 90, 91, 93, 94-114, 118,
 122-132, 136-143, 145-156, 160, 165,
 166, 168, 169, 171, 172, 173, 175, 179,
 180-195, 197, 198, 199, 200, 202, 203,
 205, 210, 212-251, 254, 255, 256, 257,
 259, 265, 266, 268, 269, 275, 276, 277,
 278, 279, 281, 283, 286, 288, 289, 310,
 311, 312, 313, 315, 316, 317, 319, 322,
 323, 324, 325
 supply-chain structures 232, 233, 234
 supply network collaboration 82
 supply network planning 82
 supply risk 20, 28, 29, 30
 system breakdowns 16
 system interdependencies 182, 185
 system security 197, 204, 205, 206, 207, 209,
 210

T

Target 56, 57
 technological development 55
 technology systems 232
 terminal planning 316
 terrorism 213
 text-based formats 293
 third-party reverse logistics (3PL) 72
 time delays 231
 top-line profit growth 77
 total quality management (TQM) 66
 trade logistics 76, 77
 transportation logistics 286
 transportation management systems (TMS) 78
 transport capacity 311, 315
 trust-based approaches 181
 trust-based decision making 181
 trust-based risk management 182, 184, 195
 trust evaluations 181, 185, 186, 189, 194

tsunamis 16, 21
 Two-Stage Production-Transportation (TSPT)
 275
 two-stage supply chains 254, 255, 256, 259,
 267, 268, 269

U

uncontrollable factors 242
 Unified Modeling Language (UML) 110, 117,
 118, 124
 Universal Description Discovery and Integra-
 tion (UDDI) 291, 303, 304, 306, 307
 University Grants Commission (UGC) 336
 US Department of Defense 56

V

value chains 77
 vendor managed inventory (VMI) 109, 110
 vertical information sharing 96
 vertical integration 141
 virtual communities 181, 182, 185
 virtual enterprises 256

W

Wal-Mart 56, 60, 62, 140
 warehouse control systems (WCS) 78
 warehouse management systems (WMS) 78,
 81
 warehousing 20, 311, 315, 316, 319, 320, 321,
 322
 warehousing spaces 315
 Web service finder agents 290
 Web services 290, 291, 292, 293, 294, 300,
 301, 302, 303, 304, 306, 307, 309
 Web services paradigms 290
 WhoAgent 113
 wholesale price contracts 128, 129, 131, 132,
 133, 134, 136
 wholesale prices 3, 5, 7, 8, 9, 10, 12, 13, 128,
 129, 131, 132, 133, 134, 135, 136
 wholesalers 109, 110, 111, 113, 114, 115, 116,
 117, 121, 122, 181
 workflow systems 293