Index

3PL (third-party logistics service providers), 93

A
Accumulated difference, 184
Active approach, 54
Aggregation
  product data, 26–27
  revenue, levels of, 27
Airborne Express, 111
Airfreight, 112
APICS, 93–94, 309
Arc, 106
Architects, supply chain, 4
Arrow, 17
Artificial demand, 269
ASCM (advanced supply chain management), 93
ASN (advanced shipment notification), 105
Assembly buffer, 241
ASTEC, 17
Auction
  Dutch, 271
  forward, 338
  reverse, 271, 338
Available-to-promise (ATP), 280, 288
AVL (approved vendor list), 142

B
Balance sheet, outsourcing implications on, 218–221
Bank
  beneficiary, 119
  issuing, 119
Base product, 60
Beer Game, 264
BOC (bill of cash), 164–166
BOM (bill of materials)
  A-type, 18, 28, 62–64
  data structures, 142–147
  domestically integrated, 96–103
  engineering, 144–145
  internationally partitioned, 98–101
  I-type, 19, 63–64
  manufacturing, 144
  manufacturing configurations for, 64
  T-type, 19, 63–64
  V-type, 19, 63–64
Boundaries
  import/export, 101, 149
  push/pull, 215
BPO (business process orientation), 173
  maturity levels, 178–179
  and supply chain management, 177
Broadcast demand, 160–161
BTS mode versus BTO mode, 266
Build forward, 181–182
Build-to-order, 181–182
Build-to-stock, 180–182
Bullwhip effect, 264
Business
  analytics, 179
  model, conceptualization of, 11–42
  strategy, 8, 366
  unit, 60
Business-to-consumer (B2C), 120–121
BXA (Bureau of Export Administration), 118

C
CAD (computer aided design), 145
Capable-to-promise (CTP), 280, 333
Capacity requirements planning (CRP), 227, 280
Capital equipment, 23–24
Capture order, 123–124
Cartage, 112
Cash buffer, 349
Cash constraint, 238
Cash flow(s), 5, 81, 89, 98, 101, 119
  synchronizing, 296
Cash inventory, 147
  data structures, 145–147
Cash-to-cash cycle, 347–349
Cathode ray tube (CRT), 66, 68
CCL (commodity control list), 118
Certification in Production and Inventory Management (CPIM), 44, 93
Change, managing, 172–173
Channel master, 49
Chaotic network, 51, 271
Closed-loop cycle, 103, 159
CM (contract manufacturer), 67
CNP (card not present), 120
COGS (cost of goods sold), 97
Collaborate, 199
Collaborative planning, forecasting, and replenishment (CPFR), 167
Commodity component, 69
Commodity control list (CCL), 118
Communication, 191–194, 196
Competency
  process core, 31
  relationship core, 32
  technological core, 31
Competing networks, 24
  analyzation of, 24–26
  mapping of, 27
Competitive advantage, defined, 31
Competitiveness, perspective on, 31
Competitive network
  designing, 85–128
  evaluating, design, 94–96, 216–217
  operation of, 209–255
Competitive threshold, 8–9, 309, 316
Composite BOM, 214
CompUSA, 17
Computer aided design (CAD), 145
Configurator, 144
Conflict, 177
  resolution, 186–191
  structured approach to resolving, 189
Connectedness, 177
Constraint buffer, 241
Consumables, 60
Container load (CL), 113
Context, 5
  customer, 6–7
  value, 7–8
Contingency
  plans, 203
  triggers and, 204
Contract manufacturer (CM), 67
Contract pricing, 338
Contribution margin, 22
Control, input/output, 227
COO (country of origin), 25, 46, 65, 115
Core competencies
  downstream zone and, 20
  fulfillment, 54
  in-sourcing versus outsourcing of, 64
  midstream zone and, 19
  upstream zone and, 18
  value-subtracting, 21
Core network, designing, 52–77
Cost of goods sold (COGS), 97
CPFR (collaborative planning, forecasting, and replenishment), 167
CPIM (Certification in Production and Inventory Management), 44, 93
Credit, refunds and, 76
Crisscrossed networks, 24
Cross-channeling, 70
CRT (cathode ray tube), 66, 68
C-TPAT (Customs-Trade Partnership Against Terrorism), 117
Customer-facing, 19
Customer-installed base, 20
Customs constraint, 238

Data, 26
  accuracy, 134
  asynchronous mode, 134
  availability, 134
  cleansing, 134
  corruption from external sources, 138
  duplication, 134
  information versus, 133
  integrity, 134
  memory, 134
  mining, 135
  owner, 134
  real-time, 134
  synchronous mode, 134
  theft, 138
  warehouse, 135
Database, relational, 134
Data structures
  basic, 139–142
  BOM, 142–147
  cash inventory, 145–147
  physical inventory, 145–147
  subcycle, 139–142
DBR (drum-buffer-rope), 229
Defective-item return, 21
Defocusing effect, 57, 65
Demand
  aggregate versus SKU, 270
  artificial, 269
  continuous, 262
  distortion, 264
  matching with supply, 336–341
  one-time, 262
  patterns, operating under, 268–270
  POS, 163
promotional, 262
quantity, 162
risk, 78
seasonal, 262
separate volatile versus nonvolatile, 273
shift in, 14–15
supply and, 262–264
timing, 162
Denial list, 118
Dependencies, unspecified, 138
DF (demand forecast), 226
DHL, 111
Direct channel, 20
Disintermediation, 272
Distributed networks, production and inventory control in, 225–226
Distribution
alternatives, physical, 54–56
applied to logistics, 122
competitor’s physical, flow, 25
physical, flow, 21–22
Documentary proof, 119
Domestic intratrading partner, 98, 101, 137
Downstream
competitor’s physical distribution flow, 25
configurations of, 20
decision logic, 58–59
dependency, 272
edge of midstream zone, 65, 70
fulfillment, designing of, 53–60, 74
supply chain network, 19–20
zone 16, 50, 55–56
Drayage, 112
DRP (distribution requirements planning), 227, 280
Duty, 114–117
Dynamic demand and networks, 268–270
Dynamic pricing, 338–341

ECCN (export classification control number), 118
Echelon, 16–17, 54
multi-, 55–56, 58–59, 323
partitioning, 93
paths, 323
reverse stream network, 73
ECR (engineering change requirements), 145
EDI (electronic data interchange), 105, 141
Education
need for in the organization, 197–198
principles-based, 197
EFT (electronic funds transfer), 106, 121, 296
Engineering BOM, 144–145
Environmental risk, 79
Equivalent throughput
attributes, performance measurement for, 186
conversion factors, 182
defined, 180
objections to, countering, 188
ERP (enterprise requirements planning), 94
ERP (enterprise resource planning), 5
Esprit de corps, 177
Evaporating cloud, 189
Evergreen renewal, 79, 82
Excel, spreadsheet analogy, 316–318
Exchange curves, 264–266
Export Classification Control Number (ECCN), 118
Export licensing, 117–118
eXtensible Markup Language (XML), 132

F
Factoring, 120
FAS (final assembly schedule), 281
Feedback, 332–334
Feedback and damage control, 196
FGI (finished goods inventory), 19, 284
Fifth Discipline, The (Senge), 197
Flow variability, 89
Flow velocity, 89
Forecast
calculating error, 278
econometric, 278
error, 274
level, 275–277
mix, 282
rate, 282
seasonal, 277–278
trend, 277
Forecasting, 273–280
supply, 274–275
Forward sales process, steps of, 53
Forward supply chain, 149
mapping of, 23
Freight
air, 112
Express Postal Service, 111
motor, 112
ocean, 113
rail, 112–113
FSPs (financial service providers), 92, 93, 105
FTZ (Free Trade Zone), 117
Functional cost minimization, 5
Functionality
excessive, 135
missing, 135
<table>
<thead>
<tr>
<th>Pages</th>
<th>GATT (General Agreement on Tariffs and Trade)</th>
<th>115</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gauge, 183</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Geographical locations, 148</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Global performance measures defining, 179–186</td>
<td></td>
</tr>
<tr>
<td></td>
<td>selecting correct, 176</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GMT (Greenwich Mean Time), 151</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GPS (Global Positioning System), 112, 156</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Green dot/red dot charts, 200–201</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gross margin, 97</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Growth strategies, 32–37</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GS&amp;A (general, sales, and administrative), 97</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>HAZMAT (hazardous material), 29, 50, 113–114, 146</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hewlett-Packard, 17</td>
<td></td>
</tr>
<tr>
<td></td>
<td>HTS (harmonized tariff schedule), 115</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Import compliance, 114–117</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Income statement, 97, 99–100, 341, 343</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INCOTERMS, 114, 166</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indirect channel, 20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>boundaries, 129–168</td>
<td></td>
</tr>
<tr>
<td></td>
<td>constraint, 238</td>
<td></td>
</tr>
<tr>
<td></td>
<td>nonubiquitous, 148–149</td>
<td></td>
</tr>
<tr>
<td></td>
<td>private, 147–148</td>
<td></td>
</tr>
<tr>
<td></td>
<td>public, 147</td>
<td></td>
</tr>
<tr>
<td></td>
<td>systems, 8, 132–138</td>
<td></td>
</tr>
<tr>
<td></td>
<td>trade secret, 148</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ubiquitous, 148</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information flow(s), 5, 81, 89, 98, 101, 118</td>
<td></td>
</tr>
<tr>
<td></td>
<td>competing with parallel, 157–165</td>
<td></td>
</tr>
<tr>
<td></td>
<td>connection characteristics, 119</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in serial networks, 159</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Information service providers (ISPs), 93</td>
<td></td>
</tr>
<tr>
<td></td>
<td>In-source assembly, 67</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intellectual property, 79, 81</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Interfaces, 136</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intermodal, 113</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intertrading partner, 97–98</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inventory, 90, 95</td>
<td></td>
</tr>
<tr>
<td></td>
<td>location, 92</td>
<td></td>
</tr>
<tr>
<td></td>
<td>placement, timing of, 272</td>
<td></td>
</tr>
<tr>
<td></td>
<td>pull zone, 301</td>
<td></td>
</tr>
<tr>
<td></td>
<td>push zone, 302–303</td>
<td></td>
</tr>
<tr>
<td></td>
<td>risk pooling, 241</td>
<td></td>
</tr>
<tr>
<td></td>
<td>spare component, 20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>valuation, 76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Investment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>decisions, 82</td>
<td></td>
</tr>
<tr>
<td></td>
<td>risk, 79</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Invoice-to-cash subcycle, 90, 91, 107</td>
<td></td>
</tr>
<tr>
<td></td>
<td>data elements required for, 144</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Invoice-to-pay subcycle, 90, 91, 107</td>
<td></td>
</tr>
<tr>
<td></td>
<td>data elements required for, 142</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IPO (international procurement organization), 50</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ISP (Internet service provider), 50, 92</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IT system, 139</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I-type bill of materials, 19</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IVL (individual validated license), 118</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Kanban, 228–229</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kanban pulled operations, 296–297</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Key Performance Indicators (KPI), 179</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>LAN (local area network), 106, 136</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Landed cost(s), 89, 95</td>
<td></td>
</tr>
<tr>
<td></td>
<td>elements of, 101–102</td>
<td></td>
</tr>
<tr>
<td></td>
<td>network partitioning to reduce, 96–103</td>
<td></td>
</tr>
<tr>
<td></td>
<td>performance measure, 110</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Language differences, 149</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCD (liquid crystal display), 271</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lean manufacturing, 16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Least common denominator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>hardware, 136</td>
<td></td>
</tr>
<tr>
<td></td>
<td>software, 136</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LED (light emitting diode), 271</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Legacy databases, 149</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Legal entity, 148</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Less-than-container load (LCL), 113</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Linked network inventories, 267–268</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loaner tracking, 76</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LOC (letter of credit), 50, 119–120</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Logistics, 16</td>
<td></td>
</tr>
<tr>
<td></td>
<td>constraint, 237–238</td>
<td></td>
</tr>
<tr>
<td></td>
<td>normal distribution applied to logistics, 122</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loop, 106</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loop velocity, elements of, 106</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lot sizing, 289</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LSPs (logistics service providers), 92, 93</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LTL (less-than-truckload), 48, 105, 107, 112, 156</td>
<td></td>
</tr>
</tbody>
</table>
Index

M
Machine constraint, 237
Management policy constraint, 238
Management reporting, limited, 136
Manufacturing
bill of materials (BOM), 144
centralized versus decentralized, 65
international, 65
midstream, configurations, 65
networks, 6
organizations, 149
single/parallel, 65
site location, 65
Mapping, 23–28, 133
internal data and, 30
process, 104
reverse network, 30
Market demand, 240
Markup, 57
Material constraint, 238
Material flow, 5, 98, 101
Materials requirements planning (MRP), 227, 280
Merge in-transit, 156
Message
content, 191
context, 191
dissemination, 192, 193
Midstream
competitor’s physical distribution flow, 25
manufacturing designing, 60–68
scope of, 62
supply chain network, 18–19
trading partner decision logic, 63
zone, 16, 50, 59, 65
MOTO (mail order telephone order), 120
Motor freight, 112
MPS (master production schedule), 138
MRP II (manufacturing resource planning), 226–27, 290
Multiple source, 70
capable, 237, 241–242
cash levels, 272
cause-and-effect relationships within, 311–312
chaotic, 51, 271
classes of, 6, 47–77
collaborating, 43–84
competing, 24
complexity and, 266
constant, repetitive demand as the planning baseline, 266–268
constraint, 237–239
crisscrossed, 24
cycles in, 261
demand distortion and the bullwhip effect, 264
design, 7, 68, 94, 383–389
discontinuities in, 271
dynamic demand patterns, operating under, 268–270
dynamic pricing and, 338–341
exchange curves, 264–266
forecasting and, 273–280
income statements and optimization, 341–345
integration, 94
inventory, 240–252
inventory and service levels, 264–266
linked, inventories, 267–268
manufacturing, 6
mapping of, 23–28, 30
market demand as a probability, 262
matching the pattern of demand and supply in, 266–264
need for collaboration in, 269
operating with different sets of planning rules, 270–271
operations, 7, 94
optimizing, 315–352
orchestrator, 49–51
performance of, versus trading partners’ performances, 311–312
planning considerations, 261
planning system and, 281–282
politics, 192, 194
pricing interface, 337–338
project planning for reconfigurations, 272
purchase orders versus managed inventory in, 290
return on invested capital (ROIC), 313–315
reverse, 6
reverse auction implementations in, 271
risk and, 268
risk management and financial performance, 348–349
serial, 23
service, 6
static, 51
N
NDA (nondisclosure agreement), 148
Negotiation, 186–191
Network(s)
artificial demand and, 269
balance sheets and optimization in, 345–347
basic operations, 261–262
blueprint for, 381–404
BTS mode versus STO mode, 266
bullwhip effect, 264
capability, 272
pricing interface, 337–338
Supply Chain Architecture

O

Ocean freight, 113
OEM (original equipment manufacturers), 50, 77, 273
Optimization, static versus dynamic, 331–332
Order backlog, 284–285
Order fulfillment, methods for, 54–60
Order-to-acknowledgment cycle, 91
Order-to-advance shipment notice (ASN), 91
Order-to-delivery subcycle, 90, 91, 103, 104, 107, 124
data elements required for, 141
Order-to-stock subcycle, 90, 104, 107
data elements required for, 141
Organizational behavior, 8
Organizations
horizontal versus vertical, 149
manufacturing versus service, 149
Outsourcing, 218–222

P

Parallel information flows, 157–165
Partitioned networks, 148–154
Partnership agreement, 79–80
Passive approach, 54
PCA (printed circuit assembly), 28, 66, 68
Perfect order, 333
Performance measurement, 79
attributes of effective metrics, 180
change in, 169–208
closing the feedback loop for, 333–334
defining global, 176
equivalent throughput, 179–182, 187
integration into network, 183–184
network dashboard, 183–184
project management for, 198–201
total network inventory, 242–244
Performance metrics, 179
PERT charts, 200–201
Physical distribution
approach, 54
connections, 111
constraints, 292–293
flow, 91
tracking of, 155
Physical flow, 57, 81
Physical inventory, 145
data structures, 145–147
Planning
closing the feedback loop for, 332–333
degrees of complexity, 269
Scalability, 135
SCM (supply chain event management), 156
Scenario
defined, 202
planning, 194, 202–204
SCL (special comprehensive license), 118
Serial networks, 23
subcycles in, 157–160
Serial number tracking, 76
Service level, 57
Service networks, 6
Shared employee access, 135
Shipping buffer, 240
Single source, 17, 70
Situational specifics, 56
Skilled labor constraint, 237
SKUs (stock keeping units), 22, 60
aggregate demand versus SKU demand, 270
life cycle of, 269–270
SLA (sealed lead acid) battery, 28–30
SMED (single minute exchange of die), 239
Solectron, 17
Sole source, 17, 50
Spare(s), 60, 71
Spider diagram, 94
Spot auctions, 71
Spot source, 18, 70
SSL (secure socket layer), 138
Stakeholders, value and viewpoint of, 310
Static flow, 225
Static network, 51
Static pricing, 337
Strategic component, 69
Strategic nominal trading partner, 49
Strategic raw material, 69
Subcontractor, 70
Subcycles
closed-loop, 91
data structures, 139–142
four basic, 90, 122–124
paralleling, 163–165
rationalizing, 326–329
Success
barriers to, 9
plan for, 363–366
Supplier
direct, 70
warehouse, 70
Supply
batch, 263
flow, 263
forecast, 285
last time, 264
matching demand with, 336–340
one-time, 264
repetitive, 263
seasonal, 263
Supply chain. See also Network(s)
changes in network, 14–15
competitive threshold of, 309
definition of, 15–17
downstream, network, 19–20, 68
food industry, network in, 185
forward, 149
geographical dispersion of, 71
length, 57, 65, 103
lot sizing, impact of, 289
management, 351–352, 355
mapping, 23
midstream, network, 18–19, 68
operating with discontinuities in, 271
rationalization, 72
reverse, 149
reverse stream, 20–21
upstream, network, 17–18, 68
zones of, network, 16–17
Supply chain event management (SCEM), 156
Supply chain management, BPO components of, 177–178
Supply forecast (SF), 226
Supply risk, 78
Switched network, 51, 271
Synchronization, 229

T
Tangential networks, 23
Tariff shift, 116
Technology risk, 78
Third-party logistics service providers (3PL), 93
Throughput, 95, 244
every engine combination criteria, 232
performance measure, 110
Throughput view
clear objectives, need for, 173–174
reward and risks of, 175–176
Tier-one supplier, 18, 50, 70
Time zones, 149
TL (Track load), 156
TOC (Theory of constraints), 173, 188
Tolerance band, 183
TP (trading partner). See Trading partners
Tracking
loaner, 76
serial number, 76
Index

tracing and, 154–157
warranty, 76
Trade secret information, 148
Trading partners, 48, 108
decision logic, reverse stream, 75
decision logic, upstream, 71
definition of, 48
inventory, 311
linking, 89–93
managing risk in relationships with, 78–82
network optimization and financial performance of, 341
nominal, 48–49, 136
performance of, versus network performance, 311–312
profitability, 311
revenue, 311
reverse stream decision logic, 75
strategic nominal, 49
Training, application-specific, 197
Trigger, 106, 203
T-type bill of materials, 19

U
Ubiquitous information, 148
UOM (unit of measure), 145
UPS (United Parcel Service), 105, 107, 111
Upstream
competitor’s physical distribution flow, 25
edge of midstream zone, 65
supply chain network, 17–18
trading partner decision logic, 71
zone, 50, 70

V
Vacuum fluorescent (VF) display, 271
VAD (value-added distributors), 50
Value, 94
criteria, 31
growth strategy, 34, 37
Value and point of view, 310
Value cause and effect, 311–314
Value-delivery systems, forms of, 316–318
Value principle, 310–314
VAR (value-added resellers), 50
Variability, 94, 125
minimization of, 122–125
principle, 95, 100, 111–124
VAT (value-added tax), 115
Velocity, 94
loop, elements of, 106
maximization of, 108–111
principle, 95, 100, 103–111
Vendor managed inventory (VMI), 228, 290
VICS (Voluntary Interindustry Commerce Standards Association), 167
Vignettes
analysis of business portrayed in, 360–380
showing symptoms of a deeper problem, 355
table of, 356–359
Visualize principle, 94, 236–237, 251–252
Vital statistics, 118
Vocabulary, common, 197
Vocalize principle, 94, 222–225
V-type bill of materials, 19, 321

W
WAN (Wide area network), 136, 149
Warehouse
site location, 57
supplier, 70
Warehousing, public versus private, 57
Warranty tracking, 76
Waste streams, 16
Winter’s model, 277–278
Working capital, impact of network partitioning on, 217–222
WTO (World Trade Organization), 115

X
XML (eXtensible Markup Language), 132