ABB (Asea Brown Boveri)
  customer expectations 411
delaying 117
go for growth 135
matrix organization 115
organizational transformation 117–19
use of Ansoff’s matrix 135, 136
use of IT 141
ABC inventory management 392, 396
accounting standard 272
accounts 270–83
  financial accounts 270, 273
  an introduction 10–11
  management accounts 273
  profit and loss account 274–6
  trading account 275–6
accruals 283
activity sampling 243–5
activity-on-arrow diagrams 364
activity-on-node diagrams 364–75
ACWP (actual cost of work performed) 346–8
Adair, J. 184, 203
advertising 460–2
A/E/PM in construction contracts 380–6
aggression 155, 156
alliances 361–2
  see also partnership sourcing
annual value see equivalent annual value
annuity 301–4
Ansoff’s matrix 135–6, 452–3
anthropologists 152
arbitration 384
assets 276–82
  current assets 281–2
  fixed assets 278–81
automobile industry
  organizational innovation 34
  vehicle producer operating systems 68
BAe (British Aerospace)
  concurrent engineering 91, 92, 100
design change cost effects 54
balance sheets 274–83
  an introduction 10, 11
bar charts 339–42, 364, 370–1
Barnevik, Percy 138, 141, 142
Basic Mean Time (BMT) 245–8
Basic Time (BT) 245–8
Bass, B. M. 176, 203
bathtub curve 326
BCWP (budgeted cost of work performed) 346–8
BCWS (budgeted cost of work scheduled) 346–8
Beer, M. 196, 203
Beer, Stafford 5
behaviour 154
behaviour – constructive 155, 156
behaviour – destructive 155, 156
behavioural sciences 150, 151
Belbin – eight-role team model 190
Belbin – nine-role team model 191
Belbin, R. M. 190–4, 203
benchmarking 124
benefit cost (B/C) ratio 296, 310–11
Berne, E. 166, 167, 168, 169, 170, 171, 172
bills of quantities (BoQ) 357–8
Blake, R. R. 184, 203
blanket orders 397, 416, 417
BOMs (bills of material) 67, 70
book-keeping 283–4
Boston matrix 452–1
break-even 250, 259–63
British Steel
  use of SPC 48, 49
budgets 263–4, 273–4, 346
business chain 6, 7
business functions 6
Business Link 468
business mentors 469
business performance measurement
  an introduction 10–12
business plan
  elements 467
  a guide 487–95
business planning 435–46
business process reengineering (BPR) 67
  at Chrysler 112, 113, 132–5

capability index (Cp, Cpk) 49
capital
  working capital cycle 285–6
capital expenditure 276
capital rationing 315–16
cash 284–5
cash flow diagrams 9, 299–308, 313
Cattell, R. B. 158, 172
Cattell 16PF questionnaire 158
cause and effect (fishbone) diagrams
  47, 499–500
change control 348–9
change orders see variation orders
Channel Tunnel 351
Chrysler Corporation
  merger with Daimler 139
  purchasing policies 425
  reengineering 112, 113, 132–5
  reorganization 113
civil engineering management see construction management
Clarke, C. 187, 203
COBA program 312
collective responsibility 179
committees 177
communication 164, 165, 204
  code 208
  channel 205, 206, 207
  conceptual model 206
  encoding/decoding 209
  elevator speech 219
  feedback 206, 208, 212
  in practice 207
  medium 205, 206, 208
maintenance problems
  attenuation 211, 212
  distortion 211, 212
  noise 211, 212
  overload 211, 212
  redundancy 211, 212
multichannel
  multiple 222
  one-to-one 221
  one-to-more-than-one 221
multimedia 230
nonverbal 225
one-to-one 205
patterns 222–35
  all channel 222, 224
  chain 222, 223
  circle 222, 223
  wheel 222, 223
  Y network 222, 223
presentations 231–4
  basic principles 231
  good practice 233, 234
  preparation 231, 232
  speaker 233
  visual aids 232, 233
receiver 205, 206, 212
senses 221
transmitter 205, 206, 212
verbal 207
visual 205–29
  body language 207, 229
  charts 228
  cues 227
  impact 227
  tables 228
written 215–20
  abstracts 219
  content 216
  clarity 218
  essays 217
  fog factor 218
  readability 218
  reports 217
  structure 216
  summaries 219, 220
  syntax 216
communication barriers
  accent 209, 212
  culture 210, 212
  dialect 210, 212
  education 210, 212
  halo effect 210, 212
  jargon 209, 212, 217, 219
  linguistic style 209, 212
  personal 210, 212
  receiver behaviour 211, 212
  transmitter behaviour 211, 212
complexity, hard 149
complexity, soft 149
concurrent engineering (simultaneous engineering, SE) 84–96, 188, 335, 350, 354–7
civil engineering management 353–62, 376–86, 512–21
  see also contract management
construction management 353–62, 376–86
index

Consumer Price Index (CPI) 317
contract
   formal 189
   informal 189
   psychological 189
contract management (CM) 355, 356–7
contracts
   cost reimbursement 359–60, 383
   design-and-build see design-and-construct
   design-and-construct 355, 382
   fixed price 351–2
   lump sum 357, 382
   measurement 357–9, 381–2
   target contracts 359, 383
   turnkey 355
contribution 260–1
control charts 48
corporation see limited company
cost-benefit analysis (CBA) 311–13
cost centres 251
cost, life-cycle see life-cycle costing
cost of quality
   elements 45
   TQM effects 52
Cost Performance Index (CPI) 346–8
cost plan 339–40
costing 250–8
costs
   direct costs 250–1, 258
   fixed costs 258–63
   indirect costs 250
   initial cost 250–1
   labour costs 254–5
   materials costs 251–4
   standard costs 257–8
   variable costs 258–63
CPA see critical path planning and analysis
creative cycle model 176, 177
creditors 283, 285–6
critical path planning and analysis 341, 365–86, 464
Crosby, Philip 46, 55, 219, 234
cultural system 152
culture 23, 24
customer care 59
costing 250–8
depreciation 276, 278–81
   reducing balance method 279–81
   straight line method 279
   sum-of-the-digits method 280
   usage method 281
design
   dilemma 56, 77
   pressures to change 79–82
   using simultaneous engineering 84–101
design-and-construct contracts see contracts
discounted cash flow see DCF
division of work 194–6
   common processes 195
   customer basis 195
   location basis 195
   major purpose or function 195
   product or service 195
   staff basis 195
   time basis 195
DuPont
   links with General Motors 34, 106–8
   organization 105
educated value 346
earned value analysis 346–8
ECC2 see Engineering and Construction Contract
economic life 278–81
Egan Report 362, 385
employee involvement
   in problem solving teams 496–9
   in simultaneous engineering teams 88
empowerment 117
elevator, role of in construction contracts see
   A/E/PM
Engineering and Construction Contract 383–4
EOQ (economic order quantity) 391
equity theory 163
equivalent annual value (EAV) 303–7, 532–3
estimating costs 263–6
exchange rates 20, 137
expectancy theory 163
failure mode and effects analysis see FMEA
failure rate 325–6
failure rate data 327
fast-track engineering 335, 355
Fiedler, F. E. A. 187, 203
financial accounts see accounts
financial performance 268–95
financial ratios 287–94
   gearing ratios 292–3
   debts/assets employed ratios 293
   debt/equity ratio 292–3
financial ratios (continued)
  interest cover 293
  investor ratios 293–4
    earnings per share (EPS) 293–4
    price/earnings (P/E) ratio 294
  liquidity ratios 289–90
    current ratio 289–90
    quick ratio 290
  operating ratios 287–9
    asset turnover 288–9
    gross profit margin 287–8
    return on capital employed (ROCE) 288
  working capital turnover 289
  working capital ratios 290–2
    creditors turnover ratio 292
    debtors turnover ratio 291–2
    stock turnover ratios 290–1
first in first out (FIFO) 252–3
fixation 155, 156
float (in critical path analysis) 368
flow charts 236–8
flow diagrams 236–8
flow process charts/diagrams 236–8
FMEA (failure mode and effects analysis) 54, 325, 501–9
Ford, Henry I 4, 124, 466
Ford Motor Company
  2000 programme 126
  Q101/Q1 427
  QS9000 58
  rediscover SE 88
  staff recruitment policy 109, 110
  supply base management 426–9
  and Taylorism 33, 34
Fridrich, Heinz K. 128
frustration 155, 156
frustration model 156
Gantt chart see bar charts
GDP (gross domestic product) 20
GE matrix 451–2
Geneen, Harold 36
General Motors
  management model 34–6
  organization 106–8
  reorganization 111, 112
GNP (gross national product) 19
goal setting theory 162
group behaviour 173
group development 176
  Bass and Rytzerband model 176
  Tuckman model 176
group effectiveness 174
  individual objectives 175
  maturity of group 175
  member characteristics 175
  nature of task 175
  size 175
  group interactions 220
  group purpose 174
    individual 174
    organizational 174
  group type 174
  groups 174
  groups – mature 176
  growth rates in leading economies 19
Gunning, R. 218, 234
Hamel, Gary 39, 40, 97, 115
Harvard model 196
heavyweight programme management 87, 112
Hellreigel, D. 181, 203
Hendry, C. 197, 203
Herzberg, F. 149, 159, 161, 162, 163, 172, 460
two factor theory 161, 162
see also hygiene factors, motivators
Hewlett-Packard 130–1
hidden agenda 175
Hofstede, G. 200, 203
human resource management (HRM) 196–200
development 198
forecasting 197
HRM models 196
performance appraisal 199
personnel movement 199
recruitment 197
remuneration 199
selection 197
training 198
see also international HRM
hygiene factors (Herzberg) 162, 163
IBM
  centres of excellence 116
  decline and recovery 128, 129
ICE7 381–2
IChemE Green Book 383
incentive schemes 243–4
individual 152
individuals in pairs 164
individuality 156, 157
inflation 264–5, 316–20, 350–1
interactive management 96
interest rate 294–322
  money interest rate 316–18
  real interest rate 316–18
internal rate of return (IRR) 307–10
international HRM 200–2
  economic development 201
  economic system 202
  legislative framework 201
  national culture 200
  political system 202
interpersonal relationships 171
interrogative method 241–3
interviews 212–15
  appraisal 213
  counselling 214
  discipline 214
  induction 213
  progress 213
  recruitment 213
  selection 213
  termination 214
inventory 72, 73, 388–408
investment decisions 296–323
ISO 9000 57, 471, 510, 511
  with TickIT 57
ISO 14000 58, 137
ITT 36, 38, 39
JCT98 381
JIT see just-in-time
job enlargement 163
job enrichment 163
job scope 163
Juran, Joseph 43, 46, 55
just-in-time 324, 401–7, 462

kanban 403
Krech, D. 185, 203

last in first out (LIFO) 253
Latham Report 336, 385
leadership
  in ABB 141, 142
  in Chrysler 139
  functional model 184
  functions 184
  qualities 183
  in Shell 143
  situation 183
  styles 185, 186
  traits 183
leadership power
  organizational 182
  personal 182
  in scientific/technical environment 182

sources 182
leadership theories
  business maturity 187
  contingency 187
  technical context 187
lean manufacturing 324
Leavitt, H. J. 152, 157, 172
liabilities (in accounting) 276–8, 282–3
life-cycle costing (LCC) 296, 299, 311–13
lightweight programme management 87
Likert, Rensis 194
limited company 269–70
liquidated damages 361
logistics 407
Lutz, Robert A. 39, 87, 112, 113, 124, 132, 135

maintenance management 324–34
  maintenance cost 324
  maintenance planning 330–4
  maintenance strategy 328–30
management contracting (MC) 355–6
management – participative 156
managerial grid 184
market research 250, 462–3
market segmentation 438, 446–8
marketing 433–65
  marketing information systems 462–3
  marketing mix 434, 456–62
Martin, J. 165, 166, 167, 170, 172
Maslow, A. H. 149, 159, 160, 161, 172, 460
  hierarchy of human needs 159, 160, 163
matching principle in accounting 270
materials
  advanced materials 65, 97
  cost contribution 33
  profit influence 72
  selection 64
matrix organization 115, 116
McClelland, D. C. 162, 172
McKinsey & Co. 36
McKinsey’s 7Ss 36, 37, 434, 443, 446
meetings 177–80, 225, 345
  communications 225
  functions 178
  management of 179
  minutes 225
  types 177
method statements 338
method study 235–43
MF/1 382
Mintzberg, Henry 5, 6, 185
mission 433–5
motivation 149, 154
motivation model 155
motivation theories 159
motivators (Herzberg) 162
MRO (maintenance, repair and operating supplies) 74, 395
MRPI/MRPII 68
Mouton, J. S. 184, 203
Mullins, L. J. 156, 172, 182, 203
multiple activity charts 238–41
Myers-Briggs 158, 172
Myers-Briggs test (MBTI) 158

negotiated contracts 352, 360–2
net present value (NPV) 296–323
networks and network analysis 341, 364–75, 512–21
New Engineering Contract see Engineering and Construction Contract
Nissan Manufacturing UK
lean logistics 407
purchasing policy 424
use of SPC 49, 50
nomination of subcontractors 353
NPV and NPW see net present value

over-the-walls (OTW) engineering 77, 78, 354
overall plant effectiveness (OPE) 325
overheads 251, 255–7, 275, 286

Pareto analysis 287, 394–5
Pareto, Vilfredo 394
partnering 362, 385–6, 455
partnership sourcing 423–32
partnerships 269
payback 296–7
perfect capital market 314–15
performance measurement 10–12, 345–8, 389
performance rating factor 245–6
performance ratios 346–8
personality 156–9
dynamics 165
system 151
types 157
personality theory
ideographic approach 158
monothetic approach 158
personal relationships 164
PERT 372–5
PEST 436–8, 441
PFI/PPP 380
PLC see product life cycle
Porter’s five forces 436, 438–42
Porter’s value chain 443–5
portfolio analysis 450–4
power
connection 182
coercive 182
expert 182
within engineering environment 182
information 182
legitimate 182
referent 182
reward 182
scientific/technical 182
PPP see PFI/PPP
Pratt, S. 187, 203
precedence lists 364–75, 512–21
predetermined motion-time systems (PMTS) 244–5
present value 296–323
present worth see present value
pricing 263–7, 459–60
Private Finance Initiative see PFI/PPP
privity of contract 353, 382
procurement/purchasing 414–31
product life cycle (PLC) 448–50
product support 251
profit 250, 258–63, 284–7
profit and loss account 268, 274–6
an introduction 10, 11
programme evaluation and review technique see PERT
project definition 336–7
project management 335–63, 376–87
project management software 337
project manager 336
in construction projects see A/E/PM
project planning 337, 338–44
prudence concept in accounting 271
psychological energy 153
psychological needs 155
psychological success 153
psychologists 151
psychology, interpersonal 165
Public Private Partnership see PFI/PPP
purchasing see procurement
QFD (quality function deployment) 93–6
rating in time study 245–8
ratios see financial ratios
Raven, S. 215, 234
reinforcement theory 163
regression 155, 156
relationship marketing 454–6
reliability 326–7
reliability-centred maintenance (RCM) 331
resource charts 340–3
resource smoothing 341
Retail Price Index (RPI) 264–5, 316–18, 351
revenue expenditure 276
ROCE (return on capital employed) an introduction 10
materials management effects 70–4
see also financial ratios
Rover Group purchasing policy 424
Ryterband, E. C. 176, 203
sales revenue 275, 276, 288, 289, 291
Saturn Car Company formation 114
inventory performance 408
SBU (strategic/separate business unit) 105
schedule performance index (SPI) 346–7
schedule variance 346–7
S-curves 343, 345
self 152–4
self-concept 152, 153
self-esteem 153, 154
self-ideal 152, 153
sensitivity analysis 322
seven Ss of management see McKinsey’s 7Ss
Shell planning as learning 126
performance decline 143
Siemens 97, 98
simultaneous engineering see concurrent engineering
simultaneous engineering in construction 354–7
Six Sigma 58
Sloan, Alfred P. joins GM 34, 107
and marketing 34
and organization 35
and success 112, 123
SMART targets 199
social system 151
sociologists 151
sole traders 268
SPC (statistical process control) 46, 47
standard costs 257–8
standard rating see rating in time study
standard times 243–8
stock valuation 252–4
stocks 282, 286
stretch activity 372
strokes see transactional analysis
subcontracting 353, 355–6, 381
supply and demand 266–7
supply base management 429
supply chain 15, 16
supply system
description 411, 412, 413
engineers’ involvement 64–7
replacing supply chain 98, 411
SWOT analysis 434, 446, 475
an introduction 18
target contracts see contracts
tasks 236, 244
Taylor, Frederick W. 33, 34, 235
Taylorism 33, 235
team membership 187
team models
Belbin eight-role model 190
Belbin nine-role model 191
team role behaviour 192
team roles 190, 191
teams
flexible 194
member characteristics 190
motivation 189
project 188
technical 193
teamworking 244
tendering 264, 352, 354, 355, 360–2
three needs theory 162
time study 245–8
TOPS (team oriented problem solving) 496–9
total productive maintenance (TPM) 325
TQM (total quality management) 59–61
transactional analysis (TA) 165–71
ego substates 168
extended model 167
games 170
major ego states 167
strokes 166
subpersonality characteristics 169
theoretical model 166
transactions 165–71
complementary 167, 168, 169
crossed 168, 170
rituals 170
ulterior 170
Tuckman, B. W. 176, 192, 203
turnkey contracts see contracts
unconscious self 153
variation orders see change control
wear-in 325–6
wear-out 326
WIP (work-in-process/progress) 74
withdrawal 156
work breakdown structure (WBS) 338–9, 344–5
work measurement 234, 243–8
work relationships 165
work study 234–8
working capital cycle see capital

Xerox
  cooperative contracting 425
  corporate turnaround 127, 128
  leadership through quality 127

yield see internal rate of return

ZETA engine – Ford’s return to SE 88–91