## Subject Index

Acceptance sampling, 721–722  
Accessibility, 303  
Accommodating (in conflict resolution), 243  
Accountability:  
  dual, 262  
  and organizational structure, 90  
  shared, 16  
Accounting staff, resistance to change by, 72  
Active listening, 213–214  
Activities, overlapping, 631–633  
Activity scheduling, 383  
Activity traps, 166  
Actual cost for work performed (ACWP), 514–519, 523, 529, 534  
Actual failure, 54  
ACWP, *see* Actual cost for work performed  
Added value, 32–33  
Add-ons, 222  
Administration, project, 17–19  
Administration cycle (contracts), 680–683  
Administrative closure, 65  
Administrative skills (of project manager), 124  
Aerospace industry, 40  
Aggregate projects, 47  
“Aggressor” (employee role), 136  
Agile project management, 77, 287–288  
Allocated baseline, 395  
Alternatives:  
  analysis of, 582–589  
  in problem-solving, 220–221  
  selection of, 589–593  
  in systems approach, 80–81  
  in trade-off analysis, 581–593  
Ambiguity, 208  
Analysis phase (systems approach), 79–82  
Anxiety, 157–158  
Apportioned effort technique, 525  
Appraisals:  
  performance, 268  
  project work assignment, 259–260  
Approximate estimate, 456  
Arms race, 40  
Aspirational standards, 276  
Assertiveness (in conflict resolution), 243–244  
Assumptions, 348–351  
  documentation of, 350, 351  
  types of, 349–350  
Attribute charts, 720  
Audits:  
  project, 399–400  
  quality, 706  
Authoritarian communication style, 210  
Authority, 152  
  communications bottlenecks involving, 212–213  
  and organizational structure, 90  
  project, 148–152  
  of project managers, 9  
Avoiding (in conflict resolution), 244  
Award fees, 675  
BAs (business analysts), 562  
BAC (budget at completion), 529, 534  
Backup costs, 474–476  
Balanced matrix structures, 101
Bar (Gantt) charts, 412, 414
Baselines, see Project baselines
Base pay, 265
Bathtub Period (case study), 544–545
BCWP, see Budgeted cost for work performed
BCWS, see Budgeted cost for work scheduled
Behavioralism, 90
Belief, collective, 327–328
Benchmarking, 77–78
Benefits harvesting, 76–77
Best practices, 306–311, 624
common beliefs of, 309–310
levels of, 308–309
library, 310–311
proven vs., 307–308
Best Practices audits, 400
Best-value award strategy, 669
BI (business intelligence), 569–570
Bidder conferences, 668
Bidding process (case study), 692–693
“Blocker” (employee role), 137
Boeing, 626, 627
Bonuses, 269
“Bottom-up” risk management, 623
Brainstorming sessions, 223–224
Breakthrough projects, 111, 284–285, 287
Breakthrough technologies, 222
Budgets, 511–512
Budget at completion (BAC), 529, 534
Budgeted cost for work performed (BCWP), 514–515, 518, 519, 521, 523, 529, 534, 536
Budgeted cost for work scheduled (BCWS), 507, 514–519, 523
Burnout, 170–171
Business analysts (BAs), 562
Business case, 346–348
Business intelligence (BI), 569–570
Business models, 9
Business value, 10
CACN (cost account change notice), 507, 510
Calendar project, 443
Calibrated ordinal risk scales, 615–616
Capacity planning, 743–745, 747
Capital budgeting, 488–492
and internal rate of return, 490–491
and net present value, 490
and payback period, 488, 491–492
project budget, 511–512
and risk analysis, 492
and time value of money, 489
Capital rationing, 494–495
Case studies:
Bathtub Period, 544–545
To Bid or Not to Bid, 692–693
Conflict in Project Management, 251–256
Corwin Corporation, 491–499
Dorale Products, 771–783
Estimating Problem, 499–500
Franklin Electronics, 545–547
Honicker Corporation, 753–755
Invisible Sponsor, 451–452
Irresponsible Sponsors, 341–342
Is it Fraud?, 295–297
Kemko Manufacturing, 755–757
Leadership Effectiveness, 183–195
Management Reserve, 693–695
Mayer Manufacturing, 248–250
McRoy Aerospace, 180–182
Motivational Questionnaire, 195–201
Poor Workers, 182
Prima Donnas, 182–184
Prioritization of Projects, 340–341
Radiance International, 313–315
Reluctant Workers, 184
Risk Management Department, 641–642
Selling Executives on Project Management, 342–344
Telox Engineering, 640
Telstar International, 250–251
Trophy Project, 178–180
Williams Machine Tool Company, 37–38
Cause-and-effect analysis, 711–716
CCB (change control board), 393
Ceiling price, 673
Centers for project management expertise, 101
CERs (cost estimating relationships), 453, 655
Certainty, decision-making under, 604–605
Chain of command, 26–27, 209
Champion(s):
executive, 326
exit, 328–329
project, 21–22
Change:
and corporate culture, 74–77
management of, 71–76, 626–627
resistance to, 43–45, 71–76, 116
Change control board (CCB), 393
Change process, 74–75
Chrysler, 697
“Clarifier” (employee role), 138
Classical management, 5
Classical organizational structure, see Traditional organizational structure
Closed systems, 45
Closure phase (project life cycle), 64, 65
Code of Ethics and Professional Conduct, 276
Code of Professional Conduct, 276
Collaborating (in conflict resolution), 242–243
Collective belief, 327–328
Combative communication style, 210
Commitment(s):
of stakeholders, 330–331
of team members, 155, 156
Committee sponsorship/governance, 19–20, 324, 330
Communication(s), 202–228
active listening in, 213–214
barriers to, 206–207, 214–215
bottlenecks in, 212–213
with customers, 205
effective, 203, 208–209
environment for, 207–208
filtering of, 210
and listening, 210
as network of channels, 203
between operational islands, 4
patterns of, 166
policy for, 211
receiving of, 207
styles of, 210
and team development, 155, 157–158
techniques for improving, 208–209
in traditional organizational structure, 93
traps in, 215–216
Communications management, 208
Company, responsibilities to, 278
Compaq, 742
Compensation, 262–269
and base pay, 265
bonuses, 269
fixed compensation plans, 651
and job classification, 264
merit increases, 269
and performance appraisals, 265–268
Competence, 276
Competency models, 745–746
Competing (in conflict resolution), 243–244
Competing constraints, 7–8
Competitive cultures, 75
Compliance audits, 399
Compression, schedule, 441–442
Compromising (in conflict resolution), 243
Conceptual phase (project life cycle), 62
Conciliatory communication style, 210
Concurrent (simultaneous) engineering, 32, 631–633
Configuration management, 397–398
Conflict(s), 237–246
causes of, 238–239
conflict environment, 238–239
between line and project managers, 166
meaningful, 239
most common types of, 239
and organizational structure, 91–93
personality, 239
within project teams, 154
recognizing/understanding, in trade-off analysis, 578–580
relative intensity of, 239
schedule, 239
Conflict in Project Management (case study), 251–256
Conflict management/resolution: confrontation meetings for,
241–242
and establishment of priorities, 240
methods of, 240–241
modes of, 242–244
problems arising during, 166
project manager and, 123
role of project managers in, 239–240
and type of conflict, 244–246
Conflicts of interest, 277
Confrontation meetings, 241–242
Confronting (in conflict resolution), 242–243
“Consensus taker” (employee role), 139
Consequence tables, 225
Constraints:
competing, 7–8
primary and secondary, 7
in problem-solving, 220
in trade-off analysis, 575–577
triple, 7–8
Consultants, 372
Continuous improvement, 708, 742–743
Contract(s), 661
administration cycle for, 680–683
basic elements of, 672
checklists for evaluation of, 684
cost, 676
cost-plus, 674
cost-plus-award-fee, 594
cost-plus-fee, 677
cost-plus-fixed-fee, 594, 674
cost-plus-incentive-fee, 594, 675
cost-plus-percentage-fee, 674
cost-sharing, 676
definitive, 672
fixed-price (lump-sum), 593–594, 674, 677
Company, responsibilities to, 278
Contract(s) (Continued)

fixed-price-incentive-fee, 594, 675
fixed-price incentive successive targets, 676
fixed-price with redetermination, 676
government, 40
guaranteed maximum-share savings, 675, 677
incentive, 677, 678–679
proposal, interaction with, 684–686
and risk, 680
terminology used in, 671–674
trade-off analysis and type of, 593–594
as transition between project life-cycle phases, 663
winning new, 24–25

Contract/contractual statement of work (CSOW), 362, 394

Contract management, 662–673
activities in, 663–664
checklist for, 684
conducting procurements, 667–673
contract closure, 683
and contract types vs. risk, 680
cycle of contract administration, 680–683
definition of, 662
environment for, 662
incentive contracts, 677, 678–679
planning procurements, 664–667
procurement, 662–664
proposal-contractual interaction, 684–686
strategies for, 662
types of contracts, 673–677

Contractual closure, 65

Contract work breakdown structure (CWBS), 362–363

Control charts, 718–721
interpretation of, 721
and normal distribution, 718–719
types of, 719–721

Controlling, 146

Cooperative cultures, 75, 273
Cooper Manufacturing Company (case study), 641–642

Coordinating, 147

Corporate culture, 7, 325
and change management, 74–77
critical facets of, 76
impact on virtual project teams, 284
morality/ethics and, 273–275

Corporate governance, project governance vs., 20
Corporate procurement strategy, 662

Corwin Corporation (case study), 491–499

Cost(s):
justification of, 531–532
quality vs., 483
value-added, 644

Cost account change notice (CACN), 507, 510

Cost account codes, 506–511

Cost baseline, 529–531

Cost contracts, 676

Cost control, 501–537
and account codes, 506–511
backup costs, 474–476
budgets, 511–512
and “earned value” concept, 520–521
importance of, 501
and labor distributions, 462–463
life-cycle costing, 484–485
and logistics support, 486–487
and material costs, 534–536
and materials costs, 465–466

and MCCS, 501–503, 506, 507, 511–512, 527–528
and operating cycle, 506, 507
overhead rates, 463–465
problems with, 537–538
and project budget, 511–512
requirements for effective, 503
and status reporting, 537
and support costs, 465–466
in traditional organizational structure, 92

variance analysis for, 513–529

Cost estimating relationships (CERs), 453, 655

Cost formula, 523

Cost overruns, 525–526, 532–534

Cost performance index (CPI), 517–519, 528

Cost-plus-award-fee contracts, 594

Cost-plus contracts, 675

Cost-plus-fixed-fee contracts, 594, 674–675, 677

Cost-plus-incentive-fee contracts, 594, 675, 679

Cost-plus-percentage-fee contracts, 675

Cost reduction efforts, 222

Cost-sharing contracts, 676

Cost variance (CV), 515–516

Counseling, 147

CPI, see Cost performance index

CPM, see Critical path method

Crash times, 432–434

Creativity, in problem-solving, 221

Credibility, 303

Critical assumptions, 350

Critical path method (CPM), 409, 416, 421, 423–428, 432–437

Critical success factors (CSFs), 52–54

Crosby, Phillip B., 701

CSFs (critical success factors), 52–54
Subject Index

CSOW (contract/contractual statement of work), 362, 394
Culture, corporate, see Corporate culture
Cumulative average hours, 648–659
Cumulative total hours, 648
Customers:
  communication with, 214–215
  engagement with, 66–67
  and quality management, 697, 698
  unethical/imoral requests by, 273–274
Customer approval milestones, 357
Customer review meetings, 212
Customer Satisfaction Management phase, 66
CV (cost variance), 515–516
CWBS (contract work breakdown structure), 362–363
Dashboards, 566–569
Dashboard reporting, 51
Data gathering, 217, 219
Data tables/arrays, 711
Davis, David, 328–329
Decision making:
  under certainty, 604–605
  inappropriate influences on, 277
  meetings for, 219–220
  predicting outcome of, 224–225
  and problem solving, 215–216
  under risk, 606–607
  by teams, 157–158
  under uncertainty, 607–610
Decision trees, 608–610
Decoding, 206
De facto authority, 152
Defense industry, 40
Defensive projects, 286–287
Definitive contracts, 672
Definitive estimate, 456
De jure authority, 152
Delegation, 90
  and directing, 146
  factors affecting, 151
Deliverables, 5–6
Deming, W. Edwards, 701–702
Department of Defense (DOD), 1, 40, 282
Design freeze milestones, 356–357
Design to unit production cost (DTUPC), 477
Developmental baseline, 395
Development risks, 495
“Devil’s advocate” (employee role), 137
Directing, 146–148
  difficulty of, 147
  steps of, 146–147
Discounted cash flow (DCF), 489
Discretionary dependencies, 411
Disruptive communication style, 210
Distributed budget, 512
Diversity of product lines, 105
DMAIC, 722
Documentation:
  of assumptions, 350, 351
  procedural, 737–741
  of project manager’s authority, 151
DOD, see Department of Defense
Doing, managing vs., 166–167
“Dominator” (employee role), 137
Dorale Products case studies, 771–783
DTUPC (design to unit production cost), 477
Dual accountability, 262
EAC, see Estimate at completion
Earned value (EV), 520–521, 526, 534–535, 622
Earned-value measurement systems (EVMS), 512–513, 549
Economic conditions, 651
Economies of scale, 644
Education, 171, 174, 279–281
Efficiency/effectiveness, 302–303
Eli Lilly, 745
Employees:
  assignment of responsibilities to, 133
  evaluation of, 165
  functional, 17
  performance measurement with, 257–262
  problems with, 165–166
  project manager and performance of, 164
  “roles” of, 136–137
  “star,” 133
Encoding, 206
“Encourager” (employee role), 138
End-of-phase review meetings, 752
Engagement project management, 66–67, 331
Engineering staff, resistance to change by, 72
Enhancements, 222
Enterprise Environmental Factors, 662
Enterprise project management methodologies, 398–399
Enterprise resource planning (ERP), 550
Entrepreneurial skills (of project manager), 124
Entry-level project managers, 9
Environment(s):
  communications, 207–208
  for conflict, 238–240
  dynamic project, 154, 156
  and organizational structure, 89–90
  problems in, 165
  review of project, 580–581
  staffing, 116–117
Equivalent units, 523
Ericsson, 742
ERP (enterprise resource planning), 550
Estimates, 453
of activity times, 428–429
case study, 499–500
good information for, 455
for high-risk projects,
479–480
and life-cycle costing,
484–485
and logistics support, 486–487
and low-bidder dilemma,
474–477
parametric, 455–456
pitfalls with, 478
10 percent solution with, 483
of total project time, 429–430
types of, 455–458
Estimate at completion (EAC),
507, 524–528
Estimated cost, 673
Estimated cost to complete
(ETC), 529
Estimating manuals, 456–458
Estimating Problem (case study),
499–500
Estimative probability risk
scales, 616
ETC (estimated cost to complete), 529
Ethics, 273–275
Ethical communication style, 210
EV, see Earned value
Evaluations, employee, 257–262
EVMS, see Earned-value measurement systems
Excellence, 49–50
Execution failure, 57–58
Execution risks, 495
Executives, 317
as champions, 326
and committee sponsorship,
324
and decentralization of project
management, 325
defining role of, 17
and in-house representatives,
329
and management of scope
creep, 326
in matrix organizations, 97
and planning, 373–379
and program managers,
124–125
and project management-line
management relationship,
11–13
as project managers, 125
and project office, 132
and project selection, 373–377
as project sponsors, 317–326
and risk management, 325
selection of project manager
by, 117–121
as sponsors of multiple proj-
ects, 320
team support from, 111, 155,
157
in traditional organizational
structure, 93
working with, 17–19
Exit audits, 399
Exit champions, 328–329
Exit ramps, 329
Expectations:
project, 54, 56, 303–305
stakeholder, 331
Expected profit, 673
Expert power, 152
Explicit assumptions, 349
Extended systems, 45
External dependencies, 417
External partnerships, 279
Facilitating communication
style, 210
Facilitation, 226–228
Failure, 54–60
causes of, 57–59
costs of, 707
degrees of, 59–60
of governance, 325–326
of innovation projects, 285
KPI, 560
of methodologies, 70–71
of planning, 380–381
of public-sector projects, 31
of stakeholder relationship
management, 335
Fairness, 276
Fears, embedded, 73
50/50 rule, 522–523
Filtering, 210
Finance staff, resistance to
change by, 72
Financial closure, 65
Financial risks, 495
Firsthand observations, 444
Fishbone diagrams, 711–713
Five Whys, 723
Fixed baseline, 395
Fixed compensation plans, 651
Fixed-price (lump sum) con-
tracts, 593–594, 674, 677
Fixed-price-incentive-fee con-
tracts, 594, 675, 677, 678
Fixed-price incentive successive
targets contracts, 676
Fixed-price with redetermination
contracts, 676
Follow-on orders, 655–656
Ford Motor Company, 697
Forecasting technology, 40
Formal authority-oriented lead-
ership techniques, 160
Fragmented cultures, 75
Frameworks, 69, 285
Franklin Electronics (case
study), 545–547
Fraud (case study), 295–297
Front-end analysis, 280
Functional baseline, 395
Functional employees, 17
Functional gaps, 4
Functional manager(s), 15–16.
See also Line manager(s)
Functional organizations, 116
Future of project management, 126–127
Gantt (bar) charts, 412, 414
Gaps, organizational, 4, 5
Gates (stage-gate process), 60–61
“Gate keeper” (employee role), 60–61, 139
Gate review meetings, 65
General Electric (GE), 722
General Motors, 697
GERT (Graphical Evaluation and Review Technique), 416
Gifts, acceptance of, 278
Goal of project management, 110
“Go live” stage, 76
Governance:
corporate, 20
failure in, 325–326
project, 19–20
Government contracting, 40
Graphical Evaluation and Review Technique (GERT), 416
Graphic analysis (time/cost curves), 583–588
fixed cost, 585–586
fixed performance levels, 583–585
fixed time, 586–587
learning curves, 646–657
no constraints fixed, 587–588
Group passing technique, 291
Guaranteed maximum-share savings contracts, 675, 677
Hardware deliverables, 6
“Harmonizer” (employee role), 138
Hierarchical referral, 240–241
Hierarchy(-ies):
considerations of, 108
of management, 4
High-risk projects, estimating, 479–480
History of project management, 1–2, 39–45
Hodgetts, Richard M., 159
Honesty, 276
Honicker Corporation (case study), 753–755
Horizontal work flow, 4
Human behavior education, 171, 174
Human relations-oriented leadership techniques, 159–160
Human Resources staff, resistance to change by, 72
Hurwicz criterion, 607
Hybrid project management, 44
IFB (invitation for bid), 669
Impact implementation matrix, 226
Implementation phase (project life cycle), 63
Implicit assumptions, 349
Incentive contracts, 677, 678–679
Incentive plans, 269
Incompetency, 130
Individual projects, 47
Influence, 245–246, 277
Informal project management, 25, 40–51
Information flow, 334–335
“Information giver” (employee role), 138
“Information seeker” (employee role), 138
Information technology staff, resistance to change by, 72
In-house representatives, 329
“Innovator” (employee role), 138
Innovation, 221–222
Innovation projects, 284–287
Integrated product/project teams (IPTs), 281–283
Integrative responsibilities, 13–14
Integrity, 276
Intellectual property, 77–78
Interface management, 14
Interim deliverables, 6
Internal partnerships, 278–279
Internal rate of return (IRR), 490–491
International Institute for Learning, 398
International project management, 31–32
Interpersonal Influences, 152–154, 245–246
Interval risk scales, 615
Intimidating communication style, 210
Invitation for bid (IFB), 669
IRR (internal rate of return), 490–491
Irresponsible Sponsors (case study), 341–342
ISO 9000, 698–699
Isolated cultures, 75
Issues, 602
Japan, 702
Job classification, 264
Job descriptions, 264
Johnson Controls, 742
Judicial communication style, 210
Kaizen events, 723
Kemko Manufacturing (case study), 755–757
Key performance indicators (KPIs), 54, 334, 555–560
characteristics of, 558–560
components of, 557–558
failure of, 560
need for, 555–556
using, 557
Kickoff meetings, 358–360
KISS rule, 147
Knowing oneself, 166
KPIs, see Key performance indicators

Labor distributions, 462–463
Labor efficiency, 650–653
Labor-intensive projects/organizations, 104
Lag, 440–441
Laplace criterion, 608
Large projects, 271–273, 328–329, 385
LCC, see Life-cycle costing
Leadership, 159–163
definition of, 159
elements of, 159
organizational impact of, 163–165
by project manager, 122, 154, 159–160, 163–165
quality, 723–724
in talent triangle, 10
of team, 154, 156
techniques for, 159–160
transformational project management, 163
value-based, 160–162
Leadership Effectiveness (case studies), 183–195
Lean manufacturing, 722–723
Lean Six Sigma, 722–723
Learning, 279–281
Learning curves, 456, 643–657
as competitive weapon, 657
cumulative average curve, 648–659
factors affecting, 650–653
and follow-on orders, 655–656
graphic representation of, 646–657
key phrases associated with, 647–648
limitations of, 656–657
and manufacturing breaks, 656
and method of cost recording, 654
selection of, 654–655
slope measures for, 653–654
Legitimate power, 152
Lessons learned, 623–624
Letter contract (letter of intent), 672–673
Level of effort method, 524
Life cycle, project, 24, 61–66
closure phase, 64, 65
conceptual phase, 62
Customer Satisfaction
Management phase, 66
implementation phase, 63
milestones in, 356–357
and planning, 355
planning phase, 62
and risk, 612
stage-gate process vs., 61
testing phase, 64
Life-cycle costing (LCC), 477, 484–485
benefits of, 485
estimates in, 485
limitations of, 485
Linear responsibility charts (LRCs), 150–151, 385
Line manager(s):
authority of, 148
and communications policy, 211
and employee evaluations, 258, 260–262
over-the-fence management by, 39–40
position power of, 153
and project managers, 11–13, 166, 278
and selection of project staff, 133
Listening, 210, 213–214
Logistics support, 486–487
Long-term projects, 5
Lot-release system, 654
Low-bidder dilemma, 474–477
LRCs, see Linear responsibility charts
McRoy Aerospace (case study), 180–182
Maintainability, 698
Management:
of change, 71–76
classical, 5
communications, 208
configuration, 397–398
effectiveness of, 503
phases of, 501, 506
variance analysis in, 527–528
Management gaps, 4
Management pitfalls, 166–170
Management reserve, 511–512, 693–695
Managing, doing vs., 166–167
Mandatory dependencies, 417
Manpower requirements, projected, 469–470
Manufacturing breaks, 656
Manufacturing engineers, 28
Manufacturing staff, resistance to change by, 72
Marketing, 24–25
Marketing staff, resistance to change by, 72
Master production schedule (MPS), 385–386
Material costs, 465–466, 534–536
recording, using earned value measurement, 534–535
variances in, 535–536
Matrix organizational structure, 95–99, 104–105
development of, 95–96
functional managers in, 97
strong/weak/balanced, 101
Matrix projects, 47
Maturity, 41
definition of, 49–50
Maximax criterion, 607–608
Maximin criterion, 607
Mayer Manufacturing (case study), 248–250
MCCS, see Management cost and control system
Meaningful conflict, 239
Meetings:
confrontation, 241–242
effective, 210–211
end-of-phase review meetings, 752
kickoff, 358–360
for problem solving and decision making, 219–220
project review, 212
Mega projects, 271–273
Merit increases, 269
Methodologies, project management, 66–71, 628, 741–742, 747–748
creating (case study), 86–87
failure of, 70–71
and frameworks, 69
Metrics, 549–570
benefits of, 551–552
and business intelligence, 569–570
classification of, 553
dashboards and scorecards, 566–569
and failure, 552–553
identifying, 553–554
key performance indicators (KPIs), 555–560
program, 622
and role of project manager, 551
value-based, 561–566
Milestones, project life-cycle, 356–357
Milestone schedules, 364
Milestone technique, 522–523
Minimax criterion, 607–608
Modified matrix structures, 99–100
Monte Carlo process, 617–619
Morality, 273–275
Motivation, 146–148
Motivational Questionnaire (case study), 195–201
Motorola, 719, 722, 742
MPS (master production schedule), 385–386
Multiple projects, managing, 747–748
Multiproject analysis, 444
Multiproject baseline, 395
NASA, 40
Net present value (NPV), 490
Networks of channels, 203
Network scheduling techniques, 409–444
activity time estimation, 428–429
alternative models, 436–437
crash times in, 432
dependencies in, 417
lag in, 440–441
myths of schedule compression, 441–442
precedence networks, 437–440
project management software, 443–444
and replanning, 423–428
scheduling problems, 441
slack time in, 417–423
total project time estimation, 429–430
New product creation, 222
Next-generation projects, 222
Noise, 208
Nominal risk scales, 615
Noncooperative cultures, 75
Nonprofit organizations, 596
Non-project-based organizations, 22
Non-project-driven organizations, 22–23, 41, 44, 596
Normal distribution, 718–719
Normal performance budget, 512
Nortel, 742
NPV (net present value), 490
Objectives:
establishing, 360–361
quality, 704–705
reviewing, 580
unclear, 154, 157
validating, 351–352
Observations, firsthand, 444
Offensive projects, 286
Open systems, 45
Operability, 698
Operating cycle, 506, 507
Operational-driven organizations, 22
Operational islands, 4
Opportunities:
project, 25, 602–603
response options for, 621
Order-of-magnitude analysis, 456
Ordinal risk scales, 615
Organization(s):
class/prestige gaps in, 4, 5
impact of leadership on, 163–165
labor-intensive, 104
location of project manager within, 26–27
project-driven, marketing in, 24–25
project-driven vs. non-project-driven, 22–23
Organizational chart, project, 133–135
Organizational redesign, 107–109
Organizational restructuring, 90
Organizational risks, 495
Organizational skills (of project manager), 124
Organizational structure(s), 89–111
and environment, 89–90
matrix organizational form, 95–99
modified matrix structures, 99–100
pure product (projectized) organization, 93–94
redesign of, 107–109
selection of, 103–106
strategic business units, 106–107
traditional (classical), 91–93
and work flow, 90–91
Overhead rates, 463–465
Overlapping activities, 631–633
Over-the-fence management, 39–40
Parametric estimate, 455–456
Pareto analysis, 714–716
Partnerships:
  external, 279
  internal, 278–279
Part-time project managers, 125
Payback period, 488, 491–492
Pay classes/grades, 265
Penalty power, 152
People skills, task vs., 167
Perceived failure, 54, 56
Percent complete, 523
Perception barriers to communication, 206
Performance, personnel, 116, 165
Performance appraisals, 265–268
Performance audits, 399
Performance measurement:
  with employees, 257–262
  project baseline for, 392–393
  with project managers, 266–267
  with project personnel, 268
Performance measurement baseline (PMB), 392–393
Personality conflicts, 239
Personal power, 152
Personal resistance, 71
Personal values, 165–166
Personnel, see Staffing
PERT, see Program Evaluation and Review Technique
Phaseouts, project, 381–383
P&L (profit and loss), 44
Planning:
  and configuration management, 397–398
  cycle of, 378–379
  definition of, 345
  detailed schedules/charts, use of, 383–385
  failure of, 57–58, 380–381
  and focusing on target, 354–355
  general, 352–355
  and identification of specifications, 363–364
  and life cycle phases, 355
  and management control, 396–397
  master production schedule, use of, 385–386
  and milestone schedules, 364
  and organizational level, 354
  participants in, 360
  as phase, 352–355
  for phaseouts/transfers, 381–383
  project baselines, 392–395
  project charter, use of, 391–392
  by project manager, 20–21, 123–124
  project plan use in, 386–390
  quality plan, 706
  questions to ask when, 367
  risk, 611–612
  role of executive in, 373–379
  role of project manager in, 345
  and statement of work, 361–363
  and stopped projects, 381
  subdivided work descriptions use in, 379–380
  tools/techniques for, 360–361
  validation of assumptions in, 348–351
  and work breakdown, 365–372
Planning failure, 55, 56
Planning phase (project life cycle), 62–63, 355
PMB (performance measurement baseline), 392–393
PMBOK, see Project Management Institute Guide to the Body of Knowledge
PMIS, see Project management information systems
PMM (project management maturity model), 733–737
PMOs, see Project management offices
PMP (Project Management Professional), 111
POs, see Project offices
Poka-yoke, 723
Policies and procedures, management, 171
Policy:
  communications, 211
  conflict-resolution, 240–241
  personnel, 116
  quality, 704
Political failure, 59
Political risks, 495
Portfolio management, project, 335–337
Position power, 153
Power, 152–154
Precedence networks, 437–440
Prekickoff meeting, 359
Price-based award strategy, 669
Price ceiling, 673
Price variances (PV), 535, 536
Pricing, 453
  and backup costs, 474–476
devolving strategies for, 453–455
and labor distributions, 462–463
and low-bidder dilemma, 474–477
and manpower requirements, 469–470
and materials/support costs, 465–466
  organizational input needed for, 460–462
and overhead rates, 463–465
pitfalls with, 478
process of, 458–460
reports, pricing, 466–469
review procedure, 471–472
in smaller companies, 271
special problems with, 477–478
steps in, 466–468
  systems, 472–473
Primary constraints, 7
Primary success factors, 52–53
Priorities:
  among risks, 624–626
  conflict resolution and establishment of, 240
  project, 747
  and project success, 303
Prioritization of Projects (case study), 340–341
Problems, 215–217, 219, 602–603
Problem data, 217, 219
Problem identification, 215–216
Problem-solving:
  creativity in, 221
data gathering for, 217, 219
  and decision making, 215–216
evaluating alternatives in, 220–221
  by management, 164–165
in matrix organizations, 97
meetings for, 219–220
project, 215–223
  systems approach to, 79–82
Procedural documentation, 737–741
Procurement, 662–664
  conducting, 667–673
  planning for, 664–667
Procurement staff, resistance to change by, 72
Produceability, 747
Product baseline, 395
Product improvements, 222
Production point, 673
Production risk, 612
Product management, project management vs., 47–48
Professionalism, 275–276
Professional resistance, 71–74
Profit and loss (P&L), 44
Profit ceiling, 673
Profit floor, 673
Programs:
  definitions of, 53–54
  projects as subdivision of, 46
  projects vs., 46
  as subsystems, 45
Program Evaluation and Review Technique (PERT), 410–416, 419–423, 434, 436
activity time, estimation of, 428–429
advantages of, 411
alternatives to, 436–437
conversion of bar charts to, 412, 414
CPM vs., 416
  crash times in, 432
critical path in, 416
development of, 410–411
disadvantages of, 411
GERT vs., 416
problem areas in, 436
replanning techniques with, 423–428
slack time in, 419–423
  standard nomenclature in, 411–412
steps in, 430–431
total project time, estimation of, 429–430
Program managers, PMI certification program for, 47
Program metrics, 622
Project(s):
  breakthrough, 284–285
categories of, 47
classification of, 25, 286–287
defining success of, 7
definitions of, 2, 53–54
as “good business,” 24–25
  labor-intensive, 104
long-term, 5
  mega, 271–273
organizational chart for, 133–135
outcomes for, 2
procurement strategy for, 662–663
projects vs., 46
  scope of, 361
  short-term, 5
technology-based, 10–11
terminated, 381–383
Project audits, 399–400
Project-based organizations, 22–23
Project baselines, 392–395
performance measurement, 392–393
rebaselining, 393
types of, 395
Project champions, 21–22
Project charter, 391–392
Project charter authority, 152
Project closure, 64, 65
Project-driven organizations, 22–23, 116
career paths leading to executive management in, 27
marketing in, 24–25
resource trade-offs in, 596
Project engineers, 28
Project failure, see Failure
Project financing, 494–495
Project governance, 21–22
Projectized (pure product) organizations, 93–94
Project management, 48
agile, 77, 287–288
benefits of, 42
controlling function of, 146
corporate commitment to, 7
definition of, 47
differing views of, 27–28
directing function of, 146–148
driving forces leading to recognition of need for, 41
growth, 66–67, 331
evolution of, 1–2, 39–45
excellence in, 7
future of, 126–127
hybrid, 44
industry classification by utilization of, 43
informal, 25
and integration of company efforts, 104
international, 31–32
matrix management vs., 95
potential benefits from, 3
process groups in, 2–3
product management vs., 47–48
and project authority, 148–152
public-sector, 28–31
risk management linked to, 604
successful, 3, 17–18, 116
transformational, 163
ultimate goal of, 110
Project management information systems (PMIS), 549–550
Project Management Institute Guide to the Body of Knowledge (PMBOK), 514, 705–706, 789–794
Project Management Knowledge Base, 276
Project management maturity: criteria for, 110
failures that delay, 109–111
Project management maturity model (PMMM), 733–737
Project management methodologies, see Methodologies, project management
Project management offices (PMOs), 101–103. See also Project offices
Project Management Professional (PMP), 111
Project manager(s):
and added-value opportunities, 32–33
administrative skills of, 124
attitude of, 7
authority of, 9
and communications policy, 211
as communicator, 208–211
and conflict resolution, 239–240
conflict resolution skills of, 123
duties of, 127–128
and employee evaluations, 257–260
entrepreneurial skills of, 124
entry-level, 9
executives as, 125
expectations of, 303–305
integrative responsibilities of, 13–14
leadership skills of, 122, 154, 159–160, 163–165
and line managers, 11–13, 166, 278
location of, within organization, 26–27
management support-building skills of, 124–125
in matrix organizations, 97, 104–105
mistakes made by, 139–140
multiple projects under single, 125
next generation of, 126–127
organizational skills of, 124
part-time, 125
performance measurement for, 266–267
personal attributes of, 117, 119
and planning, 345
as planning agent, 20–21
planning skills of, 123–124
PMI certification program for, 47
and problems with employees, 165–166
professional responsibilities of, 276–278
project champions vs., 21–22
in project selection process, 377
in pure product organizations, 94
qualifications of, 127–128
resource allocation skills of, 125
responsibilities of, 4, 118–119, 127–128, 276–278
and risk, 166
role of, 13–14
selection of, 117–121
skill requirements for, 121–125
team-building skills of, 121–122
technical expertise of, 117, 123
use of interpersonal influences by, 152–154, 245–246
Project milestone schedules, 269, 364
Project offices (POs), 129, 131–132, 270
communications bottleneck in, 212–213
and pricing, 471–472
scheduling by, 383
Project opportunities, 25
Project plans, 386–390
benefits of, 386
development of, 386
distribution of, 389
structure of, 389
Project portfolio management, 335–337
Project pricing model, 473
Project review meetings, 212
Project risk, 480–483, 612
Project selection process, 285, 377
Project specifications, 363–364
Project-specific baseline, 395
Project sponsors, 317–326
committees as, 19–20, 324
and decentralization of project sponsorship, 325
handling disagreements with, 327
invisible, 323, 451–452
irresponsible, 341–342
multinational, 323–324
multiple, 322
as primary stakeholders, 330
projects without, 320
responsibilities of, 321–322
role of, 317–326
termination of project by, 61
Project sponsorship, 17–20, 320
Promotional communication style, 210
Proposals, 684–686
Proven practices, best vs., 307–308
Public-sector project management, 28–31
Pure product (projectized) organizations, 93–94
PV (price variances), 535, 536
Qualitative risk analysis, 613, 615–616
Quality audits, 399
Quality circles, 725
Quality improvements, 222
Quality management and control, 697–728
acceptance sampling, 721–722
audits, quality, 706
cause-and-effect analysis, 711–716
and changing views of quality, 697–698
costs of, 483, 707–709
as customer-driven process, 697–698
data tables/arrays, 711
and definition of quality, 698–699
leadership, quality, 723–724
objectives, quality, 704–705
Pareto analysis, 714–716
policy, quality, 704
quality assurance, 705
quality control, 705–706
quality plan, 706
responsibility for, 724–725
scatter diagrams, 716–717
Six Sigma, 722
tools for, 709–721
trend analysis, 717–718
Quality movement, 699–703
Quantitative risk analysis, 613, 616–617
Radiance International (case study), 313–315
Radical technological breakthrough projects, 287
RAM (responsibility assignment matrix), 150
Ratio risk scales, 616
R&D, see Research and development
Rebaselining, 393
Recession, 45
“Recognition seeker” (employee role), 137
Reliability, 698
Replanning:
    network, 423–428
    project, 593
Reports/reporting, 444
pricing, 466–469
by project managers, 26–27
software for, 443
Requests for information (RFIs), 668–669
Requests for proposals (RFPs), 461–462, 669
Requests for quotation (RFQs), 668–669
Requirements (in systems approach), 80
Requirements traceability matrix (RTM), 394
Research and development (R&D):
    project management, 48, 105, 239, 484–485
    resistance to change by staff of, 72
Resistance (to change), 71–76
Resource(s): company, 11–12
trade-off of, see Trade-off analysis
Resource allocation, program managers and, 125
Resources baseline, 395
Resources Input and Review meeting, 359
Respect, 276
Responsibilities: to company/stakeholders, 278
and organizational structure, 90–91
professional, 276–278
of sponsors, 321–322
Responsibility assignment matrix (RAM), 150
Return on investment (ROI), 564
Reviews, 471–472
Review meetings, 752
Review of Ground Rules meeting, 359
Revisable baseline, 395
Rewards, financial, 275–276
Reward power, 152
RFIs (requests for information), 668–669
RFPs, see Requests for proposals
RFQs (requests for quotation), 668–669
Risk(s), 599–605
acceptance of, 620
analysis of, 613–615
avoidance of, 620
causes of, 600, 601
and concurrent engineering, 631–633
control of, 620
and decision-making, 604–610
definition of, 601–603
dependencies between, 624–628
identification of, 610, 612
and lessons learned, 623–624
levels of, 614
measuring, 430
monitoring, 611
prioritization of, 624–626
procurement, 666–667
in project financing, 495
response options for, 620–621
sources for identification of, 612
tolerance for, 603–604, 628
transfer of, 620
Risk acceptance, 620
Risk analysis, 492
Risk control, 620–621
Risk handling, 619
Risk management, 600
and change management, 626–627
considerations for implementation of, 622–623
and decision-making, 604–610
definition of, 604
and executives, 325
as failure component, 56
impact of risk handling measures, 628–630
monitoring and control of risk, 621–622
Monte Carlo process for, 617–619
overinvestment/underinvestment in, 629
process of, 610
and project management, 126
response mechanisms, risk, 619–621
training in, 611–612
uses of, 628
Risk Management Department (case study), 641–642
Risk Management Plan (RMP), 611, 619, 622–623
Risk monitoring, 611
Risk neutral position, 604
Risk planning, 611–612
Risk ratings, 614
Risk response strategy, 600
Risk scales (templates), 615–616
RMP, see Risk Management Plan
Role conflicts, with project teams, 154
Role Delineation Study (RDS), 276
RTM (requirements traceability matrix), 394
Salability, 697
Sales staff, resistance to change by, 71
Savage criterion, 607–608
SBus (strategic business units), 106–107
Scalar chain of command, 209
Scatter diagrams, 716–717
Schedules:
compression of, 441–442
master production, 385–386
preparation of, 383–385
Schedule conflicts, 239
Schedule performance index (SPI), 518, 528
Schedule performance monitoring, 622
Schedule variance (SV), 515–516
Scheduling:
activity, 383
network, see Network scheduling techniques
Scope changes, 6, 747–752
business need for, 751
business of, 748–749
and need for business knowledge, 749–750
non-approval of, 752
timing of, 750
Scope creep, 326, 751
Scope freeze milestones, 356
Scope statement, 361
Scorecards, 566–569
Secondary constraints, 7
Secondary success factors, 52–53
Secretive communication style, 210
Self-control, 166
Selling Executives on Project Management (case study), 342–344
Sensitivity analysis, 492
Shared accountability, 16
Sharing arrangement/formula, 673
Shewhart techniques, 701
Short-term projects, 5, 521
Simultaneous engineering, see Concurrent engineering
Six Sigma:
  implementing, 722
  lean, 722–723
Slack time, 417–423
Slope (of learning curve), 647, 653–654
Small companies, effective project management in, 270–271
SMART rule, 351–352, 558–559
SMEs (subject matter experts), 372
Smoothing (in conflict resolution), 243
Snyder, N. T., 283–284
Social acceptability, 698
Social groups, 73
Software, project management, 443–444
  features of, 443
  reasons for using, 110
Software deliverables, 6
Solicitation package, 667–668
Solution providers, 331–332
SOOs (Statements of Objectives), 665
SOW, see Statement of work
Space program, 40
SPCs (statistical process controls), 701, 710
Special projects, 47
Specifications, project, 363–364
SPI, see Schedule performance index
Staffing, 5, 9. See also specific job titles, e.g.: Project manager(s)
  and directing, 146
  and employee “roles,” 136–137
  environment for, 116–117
  process of, 128–131
  of teams, 154–156
Staff projects, 47
Stage-gate process, 60–61
Stakeholders:
  balancing interests of, 276
  commitments from, 330
  defined, 329
  engagement of, 334
  expectations for, 331
  failure by, 58–59
  with hidden agendas, 331
  identification of, 332
  multinational, 323–324
  of public-sector projects, 29–30
  responsibilities to, 278
  understanding issues/challenges for, 331
Stakeholder analysis, 332–333
Stakeholder mapping, 333
Stakeholder relationship management, 329–335
  and commitment, 330–331
  and engagement project management, 331
list of expectations of stakeholders in, 331
stakeholder engagement in, 334–335
stakeholder interactions agreements in, 329–330
stakeholder mapping in, 333
Standardization, product, 651
Standard Practice Manuals, 274
“Star” employees, 133
Statements of Objectives (SOOs), 665
Statement of work (SOW), 125, 361–363
  and contract statement of work, 361–362
  and contract work breakdown structure, 361–363
  misinterpretation of, 362
  preparation of, 361–363
  and requirement cycle, 664–665
  specifications in, 363–364
Statistical process controls (SPCs), 701, 710
Status, 537, 580–581
Status reporting, 537
Stonewalling, 19
Stopped projects, 381
Strategic business units (SBus), 106–107
Strategic intelligence (SI), 569–570
Strategic project pricing model, 473
“Strawman” rating definitions, 614
Stress, 170–171
Strong matrix structures, 101
Subdivided work descriptions (SWDs), 379–380
Subject matter experts (SMEs), 372
Subsystems, 64
Success, project, 52–54, 299–305. See also Failure
definitions of, 52–54
degrees of, 59–60
and effectiveness of projectmanagement, 302–303
and expectations, 303–305
predicting, 299–302

Supervising, 147
Support costs, 465–466
SV (schedule variance), 515–516
SWDs (subdivided work descriptions), 379–380
“Swing” design (communication analogy), 204
Synthesis phase (systems approach), 79
System(s):
definition of, 45–47
extended, 45
open vs. closed, 45
Systems approach, 79–82
Systems engineering, 604
Systems pricing, 472–473
Systems approach, 80

Talent triangle, 4, 10
Target cost, 673
Target profit, 673
Task skills, people skills vs., 167

Teams, project, 117, 131, 133
anxiety in, 157–158
barriers to development of, 154–158
communication within, 155, 157–158
conflicts within, 154
decision making by, 157–158
expectations of/about, 345
IPTs, 281–283
leadership of, 154, 156
management of newly formed, 157–158
ongoing process of building, 158–159
performance measurement for, 266
and project manager, 121–122
support of senior management for, 155, 157
virtual, 227, 283–284
Team members, interacting with, 281
Technical expertise, 117, 123
Technical performance measurement (TPM), 622
Technical project management, 10
Technical risk dependencies, 624–628
Technology:
forecasting, 40
project managers’ understanding of, 12
in pure product organizations, 94
radical breakthroughs in, 222
shifts in, 12
in traditional organizationalstructure, 91, 92
Technology-based projects, 10–11
Telox Engineering (case study), 640
Telstar International (case study), 250–251
Temporary assignments, 116
10 percent solution, 483
Terminated projects, 381–383
Testing phase (project life cycle), 64
Time management:
activity times, estimation of, 428–429
pitfalls of, 167–170
Time value of money, 489
Tip-of-the-iceberg syndrome, 23–24
To Bid or Not to Bid (case study), 692–693
Top-down estimate, 456
“Top down” risk management, 623
“Topic jumper” (employee role), 137
Total project time, estimation of, 429–430
Total quality management (TQM), 698, 725–728
Toyota Production System (TPS), 722
TPM (technical performance measurement), 622
TPS (Toyota Production System), 722
TQM, see Total quality management
Trade-offs, 7
Trade-off analysis, 575–597
alternatives, analyzing, 582–589
with competing constraints, 7–8
conflict, recognition/understanding of, 578–580
corrective actions, 590–591
graphic analysis, 583–588
and industry preferences, 594–596
management approval, obtaining, 593
methodology for, 578–593
objectives, review of project, 580
and project constraints, 575–577
and replanning the project, 593
selection of alternative, 589–593
status, review of project, 580–581
and type of contract, 593–594

Trade-off phase (systems approach), 79

Traditional (classical) organizational structure, 91–93
advantages of, 91–92
disadvantages of, 92

Traffic light dashboards, 566–567
Traffic light reporting system, 325
Training, 279–281
and directing, 146
for key initiatives/practices, 279–280
need for, 111
risk management, 611–612
Transfers, project, 381–383
Transformational project management leadership, 163
Translation phase (systems approach), 79
Tree diagrams, 608–610
Trend analysis, 518–524, 717–718
Trends in project management, 733–752
capacity planning, 743–745
competency models, 745–746
continuous improvement, 742–743
end-of-phase review meetings, 752
multiple projects, management of, 747–748
procedural documentation, development of, 737–741
project management maturity model, 733–737

Triple constraints, 7–8
Trophy Project (case study), 178–180
Trust, 76, 91, 108, 129

Unallocated budget, 512
Uncertainty, decision-making under, 607–610
Undistributed budget, 512
Unified Project Management Methodology (UPMM™), 398–399
United Auto Workers, 665
Unit hours, 648
Unit one, 648

UPMM™ (Unified Project Management Methodology), 398–399
Usage variances (UV), 535, 536

VAC (variance at completion), 529

Validation:
of assumptions, 348–351
of objectives, 351–352
verification and, 395–396

Value:
added, 32–33
business, 10
measurement of, 564–566

Values, personal, 165–166
Value-added costs, 644
Value-based metrics, 561–566
Value-based project leadership, 160–162
Value management methodology (VMM), 565–566

Variance analysis, 513–529
causes of variances, 526
cost variance, 515–516
and development of cost/schedule reporting system, 518

Wage and salary administration, 74
Wald criterion, 607
War rooms, 385
WBS, see Work breakdown structure
WBS (work breakdown structure) dictionary, 372–373
Weak matrix structures, 101
What-if analysis, 444
Williams Machine Tool Company (case study), 37–38
“Withdrawer” (employee role), 137
Withdrawing (in conflict resolution), 244
Work breakdown structure (WBS), 365–373, 747
   core characteristics of, 365
   decomposition problems, 370–372
   for large projects, 367, 369
   levels of, 365–369
   preparation of, 367–370
   and pricing, 458, 460
   purpose of, 365
   setting up tasks in, 367
   WBS dictionary, 372–373
Work breakdown structure (WBS) dictionary, 372–373
Work flow, 4, 90–91
Workforce stability, 650
Work habits, 73
Work specialization, 651
Yellow flag, 325
0/100 rule, 522
Zero-based budgeting, 503