INDEX

A
Acceptance tests, 395, 397
Access control requirements, 254–255, 260
Access speed, optimization of, 374–378
Acknowledgment messages, 294, 295
Acknowledgment messages, 294, 295
Acquisition strategy(-ies), 224–237
alternative matrix of, 234–236
applying concepts of, 236–237
and business need, 231–232
custom development, 226–227
and in-house experience, 232
outsourcing, 228–231
packaged software, 227–228
and project management, 233
and project skills, 233
selecting, 233–236
and time frame, 233
Actions, interface, 283, 284, 293
Action–object order, 291
Activity-based costing, 114, 116
Activity elimination, 116
Actors, in use cases, 129, 131
Adoption
   enabling, 424–427
   motivating, 423–424
Aesthetics (interface design), 270, 273
Afferent processes, 330–331
Aggregated information, 360, 362
Agile development, 47–49
Alignment, strategic, 26
Alpha testing, 395, 396
Alternative courses (use cases), 133
Alternative matrix (acquisition strategies), 234–236
Amazon, 32, 248, 254
AMR Research Inc., 38
Analysis, basic process of, 86
Analysis models, 11
Analysis phase (SDLC), 9–11, 86–88
   purpose of, 222
   transitioning to design from, 222–224
Analysis strategy, 10
APIs (application program interfaces), 248
Applications
   familiarity with, 19
   general functions of, 355
Application logic, 242, 243, 244, 260
Application program interfaces (APIs), 248
Application service providers (ASPs), 229
Application systems, 363–364
Approval committee, 10, 11, 14, 15, 18,
   19, 24, 56
Architectural components, 241–242
Architecture design, 11, 241–262
   applying concepts of, 263–264
   architectural components in, 241–242
   client–server architectures, 242–243
   client–server tiers, 243–244
   and cloud computing, 247–248
   comparing options for, 248
   creating, 249–250
   cultural and political requirements in, 257–259
   defined, 240
   hardware and software specification in, 261–262
   nonfunctional requirements in, 249, 259–260
   operational requirements in, 249–250, 259
   performance requirements in, 250–251, 259
   security requirements in, 252–257, 260
   server-based architectures, 245
   and virtualization, 247
Archive files, 358
As-is systems, 10
document analysis of, 86, 92, 94, 97,
   107–109, 110, 111, 117
duration analysis, 112–113, 116
   transitioning to to-be system from (see Transition to new system)
understanding, 86, 94, 107, 109,
   110, 112, 114
unfreezing, 410
ASPs (application service providers), 229
Assumption, 206
Asymmetric encryption algorithm, 255
Attributes
   in entity relationship diagrams, 190–191,
   197–199, 367–368
Audit files, 358
Authentication, 255–257
Availability and reliability requirements, 252, 260
B
Backups, 431
Balancing (in data flow diagrams), 162
Bar code readers, 296
Batch processing, 296
Batch reports, 301
Benchmarking
   defined, 114
   informal, 114, 117
Benefits
   change management assessment of, 418–419
   identifying, 23–24
BEP (Break-even point), 21
Beta software, 431
Beta testing, 395, 396
Bias, 302–303
Black-box unit testing, 395, 396
Black hole errors, 174–175
Boehm, Barry W., 46, 58n16, 63
Bonhams 1793 Ltd., 227
Bottom-up interviews, 97
BPA (Business process automation), 13
BPI (Business process improvement), 13
BPM (Business process management), 12
BPR (Business process reengineering), 13, 425
Breadcrumbs, 272
Breadth of information, 111
Break-even point (BEP), 21
British Airways, 51
Bugs, 391, 414–415, 428–430
Bundle, 154
Business analyst, 7, 8
Business contingency plan, 411, 416–417
Business contingency planning, 416–417
Business intelligence (BI), 360, 363
Business need, 4, 12, 15, 17, 231–232
Business processes, 159–164
Business process automation (BPA), 13
Business process improvement (BPI), 13
Business process management (BPM), 12
Business process reengineering (BPR), 13, 425
Business requirements, 14, 15, 17, 88
   defined, 88
   in systems request, 89
Business rules
   communicating, 189, 206
   defined, 189
Business scenarios, 125
Business value, 6, 14, 15, 17
Buttons, 269, 275, 283–285, 291
C
CA (certificate authority), 256
Calendar picker control, 299
Capacity requirements, 251, 260
Cardinality (ERDs), 192–193, 199
Carlson Hospitality, 26
Data storage formats, 355–365
apply concepts related to, 364
databases, 358–362
files, 355, 356–358
selecting, 362–364
Data store, 158–159
Data types, 362
Data warehousing, 360
DBMS (database management system), 355
Decision support systems (DSS), 275
Decision tables, 164
Decision trees, 164
Decomposition (of DFDs), 159, 172
Default values, 298
Delay messages, 294, 295
Default values, 298
Design tools, switching, 224
Design time, 224
Design strategy, 11
Design prototype, 46, 50
Design strategy, 11
Design time, 224
Design tools, switching, 224
Detail reports, 302, 304
Development costs, 23
DFD fragments, 166–167
DFDs, see Data flow diagrams
Digital signatures, 255
Direct conversion, 412, 414, 415
Discounted cash flows, 22
Discrete multilingual system, 258
Document analysis, 86, 92, 94, 97, 107–109,
110, 111–112, 116
Documentation
designing structure of, 398–400
identifying navigation terms, 401–403
during planning phase, 60–62
system, 397
types of, 398
user, 397
writing topics, 400–401
Documentation development, 397–403
Documentation navigation controls, 398, 399, 406
Documentation testing, 395, 396
Documentation topics, 398, 400–401
Dominion Virginia Power, 41
Drop-down menus, 293, 294
DSDM (Dynamic systems development method), 47
Duration analysis, 112–113, 116
Dynamic systems development method
(DSDM), 47
E
Ease of learning, 270, 275–276
Ease of use, 270, 275, 277
Economic feasibility, 20–26
assign values to costs and benefits, 24–25
break-even point, 21–22
cash flow analysis and measures, 20–21
defined, 20
determine cash flow, 25
discounted cash flow, 22
identify costs and benefits, 23–24
net present value (NPV), 22–23
return on investment (ROI), 21
EDS, 232
Efferent processes, 330–331
EIM (enterprise information management) systems, 207
EIS (executive information systems), 363
E-JAD, 102, 103
Elasticity, 248
Electronic JAD, 102, 103
Electronic reports, 304, 305
Embedded hyperlinks, 294
Emerging technology, 12, 14
Employees
preparing for transition, 418
resistance to change by, 418–419
Encryption, 255–257, 260
Encryption and authentication requirements, 255–257
End-user DBMSs, 355
Enterprise DBMSs, 355
Enterprise information management (EIM) systems, 207
Enterprise resource planning (ERP), 227
Entity (ERDs), 189–190
changing to tables or files, 365
dependent, 201
identifying, 196–197
independent, 201
intersection, 199–200
metadata for, 195
Entity relationship diagrams (ERDs), 187–209
advanced syntax for, 199–201
balancing DFDs with, 208–209
creating, 196–205
data dictionary and metadata in, 193–196
defined, 187
elements of, 189–193
logical, 365
physical, 365–368
reading, 188–189
validating, 203–209
Ernst & Young (E&Y), 325
ERP (enterprise resource planning), 227
Errors (DFDs), 172–176
Error messages, 295
ERWin, 187, 379
ESs (expert systems), 363
Essential use case, 133
Estimates, refining, 39, 52, 62–64
Estimation
do data storage size, 378–380
defined, 52
of project time frame, 51–52
Ethics, 6
European Central Bank, 413, 428
Event(s)
defined, 344
in program specification, 344
in use cases, 126, 128, 129, 135
Event-driven modeling, 126
Event-driven programming, 325
Exception reports, 302
Exceptions (use cases), 125, 129–130
Executive information systems (EISs), 363
Expected value, 24
Expert systems (ESs), 363
External entities, 154, 157, 159
External triggers, 129
Extreme programming (XP), 47
E&Y (Ernst & Young), 325
F
Facilitator
defined, 101
JAD, 101–105, 114
Factoring, 337
Familiarity with technology, 20, 42
Familiarity with the application, 19
Fan-in, 339, 341
FAQs (frequently asked questions), 427
Fat clients, 242, 245
FBI, 253
Feasibility analysis, 10, 18
defined, 18
economic feasibility, 20–26
organizational feasibility, 26–29
technical feasibility, 19–20
Feasibility study, 19
Feature creep, 45, 224
Fields, 272
changing attributes to, 367–368
defined, 272
Field labels, 272
File naming standards, 60
Files, 355–358
changing entities to, 365
defined, 355
File specifications, 11
First mover, 12
First normal form (1NF), 213–216
Fixed-price contracts, 230
Flags (control couples), 328, 329
Foreign keys, 358, 368
Forms, 269
aesthetics of, 273
content awareness in, 272
layout of, 270–272
L
Language prototypes, 285, 289
Layout
for data flow diagrams, 167
in interface design, 270–272, 276, 283
Learning, ease of, 270, 275–276
Legacy databases, 358
Legacy systems, 228
Legal requirements, 259
Level 0 DFDs, 160, 161, 168–171
Level 1 DFDs, 160–162, 169–172
Level 2 DFDs, 162, 180–181
Level 3 DFDs, 165
Level 1 support, 427
Level 2 support, 4272
Lewin, Kurt, 410, 411
Library modules, 327, 328
Links, 398, 399, 400
Linked lists, 356
Liquidity, 21
Lithonia Lighting, 256
Logical cohesion, 338, 339
Logical data flow diagrams, 319
Logical entity relationship diagrams, 365
Logical process models, 154, 319
Look-up files, 356
Look-up tables, 376
Loop (structure charts), 327, 328, 332
Lower CASE, 59
Lynch, Conor, 423

M
Machiavelli, Niccolo, 409
Magnetic stripe readers, 296
Mainframe, 245, 260
Maintainability requirements, 250, 259
Maintenance, system, 411, 428–430
Management
organizational, 27
of outsourcing relationships, 231
of requirements definitions, 92
Management information system (MIS), 363
Management policies
defined, 420
revision of, 420
Margin of error (estimates), 63
Marriott Corporation, 41
Master files, 356, 358
Max Productivity Incorporated, 426
McDermid, Lyn, 41
Measurements (change management), 420
Measures, cash flow, 20–21
Media, output, 304–305
Menu bars, 293
Menus, 291–293
defined, 269
design of, 291–293
Messages, navigation, 293–296
Metadata
for entity relationship diagrams, 193–196
updating, 322
Metaphors, interface, 283, 284
Methodologies, 42–51
agile development, 47–49
defined, 42
parallel development, 43
rapid application development (RAD), 45–47, 50, 51
selecting, 49–51
waterfall development, 42–44, 48–49
Microcomputer, 243
Microsoft, 425, 430
Mideware, 243
Migration plan, 411–426
business contingency plan, 416–417
change management, 418–426
components of, 411
conversion strategy, 412–416
costs and benefits assessment, 420–421
management policy revisions, 420
motivating adoption, 423–424
preparing people, 418
preparing technology, 417
and resistance to change, 418–419
training, 424–426
Milestones, 56
Miracle processes, 174–175
MIS (management information system), 363
Mission critical system, 254
Mistakes, navigation, 290–291
M:N relationships, 192, 199, 200, 375, 376
Mobile application architecture, 246
Modality (ERDs), 193, 199
Modular approach, 324–325
Modularity (ERDs), 193, 199
Modular conversion, 414, 415
Modules, 324
cohesion of, 337–339
corversion, 414, 415
identifying, 332, 334
loosely coupled, 337–339
for structure charts, 326
Motivation, 58
Moving to new system, 410. See also Transition
to new system
Multidimensional databases, 360–361
Multilingual requirements, 257–258

N
Navigation controls, 276, 278, 290
Navigation design, 290–296
basic principles of, 290–291
multiple navigation areas, 271–272
types of controls, 291–294
Navigation mechanism, 269
Net present value (NPV), 22–23, 27
Networks, 242, 247, 248
Network databases, 358
Nike, 416
Nonfunctional requirements, 88, 91–93
in architecture design, 249, 259
defined, 88, 92
Non-identifying relationship, 201
Normal course (use cases), 129, 132–134, 138
Normalization
in ERD validation, 205, 208
to optimize data storage, 373
rules of, 213–217
steps in, 213
NoSQL databases, 361–362
n-tiered architecture, 244
Null relationships, 193

O
Object–action order, 291
Object (object-oriented) databases, 360
Objects, interface, 283–284, 292, 293
Object-oriented database management systems
(OODBMs), 360
Observation, 92, 94, 109
Off -page connector, 328, 329
On-demand training, 427
1:N relationships, 192, 199, 200, 375, 376
One-on-one training, 426
1:1 relationships, 192, 375, 376
Online documentation, 398
Online processing, 296
Online support, 427
On-page connector, 328, 329
OODBMs (object-oriented database management systems), 360
Open-ended questions, 96
Open-source DBMSs, 355, 361
Operational costs, 23
Operational requirements,
90–91, 249–250, 259
Operations group, 427, 428
Optical character recognition, 296
Optimization
of access speed, 374–378
of data storage, 369–382
of data storage efficiency, 373–374
Oracle, 59, 355, 360, 362
Organizational feasibility, 26
Organizational management, 27
Orvis, 252
Outcome analysis, 114–115, 116
Output design, 300–305
basic principles of, 300–302
media, 304–305
multiple layout areas for, 270–272
types of outputs, 302–304
Output mechanism, 269, 300
Outputs
in program specification, 344
for use cases, 129–130, 132, 140
Outsourcing, 228–231
as acquisition strategy, 228–231
types of contracts for, 230
when to use, 231
Overhead, 378–379
Oxford Health Plans, 253

P
Packages, 135
Packaged software, 227–228, 231–232
Paglia, Todd, 430
Paper-based documentation, 398
Parallel conversion, 412–415, 417
Parallel development methodologies, 43
Parent entity (ERDs), 192
Parents (DFDs), 160, 161
Partial dependency, 216
Patterns, for user interfaces, 273, 276
Payback method, 21
Payment Card Industry Data Security Standards (PCI DSS), 253
Perception of costs/benefits, 419
Performance requirements, 91, 250–251, 259
Performance testing, 396, 404
Personas, 278–280
PERT chart, 62
Phased conversion, 413, 414, 415
Phases (SDLC), 8
Physical data flow diagram, 319–323
Physical data models, 355
defined, 187
moving from logical data models to, 365–369
Physical entity relationship diagrams, 365–368
Physical models, 154
Physical process models, 319–323
Pilot conversion, 413, 414, 415, 416
PKI (public key infrastructure), 256
Planning phase (SDLC), 9, 10
Platinum Technology, 187
PMP (Project Management Professional), 38, 39
Political requirements. see Cultural and political requirements
Political strategy (motivating adoption), 424
Pop-up menus, 293, 294
Portability requirements, 249–250, 259
Postconditions (use cases), 129, 130
Postimplementation activities, 427–432
project assessment, 430–432
system maintenance, 428–430
system support, 427–428
Post-session report (JAD), 105
Potential adopters, 418, 420, 421, 423–424
PPM Center software, 39
Preconditions (use cases), 129, 130
Presentation logic, 242
Primary actor, 136
Primary keys, 358, 359–360
Primavera Systems, 38, 39
Priority (in use cases), 128, 145
Private clouds, 247
Private key, 255
Probing questions, 96–98
Problem analysis, 112, 116
Problem report, 427, 428
Procedural cohesion, 338, 339
Procedural programming languages, 325, 344
Procedure manuals, 400
Process
basic elements of, 158
in data flow diagrams, 158
defined, 158
Process descriptions (DFDs), 158, 164
Process models
defined, 153
requirements in, 90
Process modeling, 153–181
applying concepts of, 170–174
creating data flow diagrams, 164–176
defining business processes with data flow diagrams, 159–164
elements of data flow diagrams, 157–159
reading data flow diagrams, 154–157
Process-oriented requirements, 90
Programs, 59
Program design, 11, 318–348
modular approaches to, 324–326
physical data flow diagram, 319–323
program design document, 343
program specification, 342–345
structure chart, 326–342
Program design document, 343
Program Evaluation and Review Technique. see
PERT chart
Program log, 389
Programming languages, 325
fourth-generation/visual, 45
Programming process, 388–390
assigning tasks, 388–389
coordinating activities, 389–390
schedule management for, 390
Program specifications, 342–345
applying concepts for, 345, 348
syntax, 342
writing, 345–346
Project activities, coordinating, 59–62
Project assessment, 430–432
Project charter, 59
Project identification and initiation, 12–18
system request, 14–15
Project initiation, 10
Project management, 7, 10, 47
and acquisition strategy, 233
applying concepts of, 62–66
critical success factors, 38
defined, 38
problem prevention with, 416–417
risk management in, 65–66
scope management in, 64
timeboxing, 64–65
Project Management Institute, 38
Project Management Professional (PMP), 38, 39
Project manager, 7, 10, 38
Project.net software, 38
Project plan, 10, 54–56
estimation of project time frame in, 51–52
margin of error in, 63
methodology options in, 47–49
refining of planning estimates in, 62–64
work plan in, 54–56
Project portfolio management, 38
Project selection, 39–40
Project size, 20
Project skills, 233
Project sponsor, 10, 14, 15, 17, 432
Project standards, 61
Project team review, 430–431
Project time frame, 42, 51–52
Project work plan, 37, 53–56, 62
ProSight, 38
Prototyping
interface design prototype, 284–286
system, 46, 49, 50
throwaway, 46, 49, 50
Pseudocode, 325, 344, 345
Public clouds, 247
Public key, 255
Public key encryption, 255
Public key infrastructure (PKI), 256
Publix, 109
Q
Qantas, 5
Queries, 360, 374
Questionnaires, 105–107, 110
Quinnipiac University, 255
R
RAD. see Rapid application development
Radio buttons, 298, 299
Radio frequency identification (RFID) tags, 297
Radisson Hotels & Resorts, 26
Range check, 300, 301
Rapid application development (RAD), 45–47, 50, 51, 65
competition in, 325
defined, 45
timeboxing with, 64–65
Rate of return, 21–23, 26
Raw data, 379
RDBMSs (relational database management systems), 359, 360
Ready adopters, 424
Real-time information, 296
Real-time reports, 301
Reference documents, 398–400
Referential integrity, 359
Refreezing new system, 411, 427
Relational database management systems (RDBMSs), 359, 360
Relational databases, 358–360, 363
Relationships (ERDs), 192
cardinality, 192–193
identifying, 199
metadata for, 196
modality, 193
Reliability, system, 42
Reluctant adopters, 424
Repeating attributes, 213
Repeating groups, 213
Reports
content awareness in, 272
layout of, 270–272
understanding usage of, 300–301
Reporting structure, 56, 57
Systems analysts, 4–7
  defined, 6
  roles of, 6–7
  skills of, 5–6
System architecture.  see Architecture design
System complexity, 42, 50
Systems Development Life Cycle (SDLC), 7–12
  analysis phase, 9–11
  and choice of methodology, 49
  defined, 4
  deliverables, 8
  design phase, 9, 11
  estimation of project time frame, 51–52
  gradual refinement, 10
  implementation phase, 9, 11–12
  phases, 8
  planning phase, 9, 10
  streamlining, 47
System documentation, 397
System interfaces, 269
System interface testing, 395, 396
System maintenance, 411, 428–430
System proposal, 11, 87, 119
System prototyping, 46, 49, 50
System reliability, 42
System requests, 10, 14–15, 86, 88, 93, 116
  change requests as, 428
System requirements
  defined, 88, 90
  transitioning to design from, 222–224
System review, 431–432
Systems integration, 260, 403
System specification, 11
System support, 411, 427–428
System tests, 395, 396
System users, 27
System value, 254

T
Tables, changing entities to, 365
Table of contents, 398, 400
Table scan, 376
Tab menus, 293, 294
Tangible benefits, 23
Tangible value, 14, 18
Task dependencies, 56
Task identification, 53–54
Technical environment requirements, 249–250, 259
Technical feasibility, 19–20
Technical lead, 57
Technical risk analysis, 19
Technical skills, 57
Techniques (SDLC), 4, 8
Technology emerging, 12, 14
  familiarity with, 20, 42
  preparing for transition, 417
  analysis, 115, 116
  interface, 283–284
Temporal cohesion, 337, 339
Temporal triggers, 129
Terminals, 245
Test case, 392
Testing, 390–397
  acceptance tests, 395–397
  inadequate, 391
  integration tests, 395, 396
  system tests, 395, 396
  test plan, 395, 396
  unit tests, 392, 395
  usability, 289
  and use cases, 134
Test plan, 395, 396
Text boxes, 298
Text design, 273
Text search, 400
Thick clients, 260
Thin clients, 242, 260
Third normal form (3NF), 216–217
Three-clicks rule, 276
Three-tiered architecture, 243
Throwaway prototyping, 46, 49, 50
Time and arrangements contracts, 230
Timeboxing, 64–65
Time estimates, 40
Time factor, in conversion, 415
Time frame, acquisition strategy and, 231, 233
Time estimates, margin of error in, 63
Time factor, in conversion, 415
Time frame, acquisition strategy and, 231, 233
Tipping Point Technology, 255
To-be models, 319
To-be system, 10.  see also Transition to new system
Tool bars, 292–294
Tool tips, 277
Top-down interviews, 97
Top-down modular approach, 324, 325
Total cost of ownership (TCO), 23
Touch screen
  hand gestures, 277
  interface design, 276–277
Trade-offs
  defined, 40
  in project management, 62
  in project selection, 40
Training
  on-demand, 427
  in transition to new system, 424–426
Training plan, 9
Transaction files, 358
Transaction processing, 296
Transaction processing systems, 363
Transaction structure, 331
Transcript, 201
Transform structure, 332
Transition to new system, 410–433
  applying concepts of, 432–433
  migration plan, 411–428
  postimplementation activities, 427–432
Transitive dependency, 216
Travelers Insurance Company, 49
Triggers (use cases), 126, 129
Turnaround documents, 302, 304
Tutorials, 398, 400
24/7, 252
Two-tiered architecture, 243
U
Ultrathin client, 245
Unfreezing habits and norms, 410
Unit tests, 392, 395
University of Georgia, 273
Unstated norms, 258
Unstructured interviews, 97
Upgrading, 431
Upper CASE, 59
Usability, 269–270
Usability testing, 289
Usage level (user interface), 273, 275
US Army, 96, 173, 416
US Department of Defense, 169, 173
Use case analysis, 124–149
  alternative formats for use cases, 127–132
  applying concepts of, 133–134
  building use cases, 134–144
  elements of use cases, 127–132
  and functional requirements, 133–134
  identifying elements within steps, 140–143
  identifying steps in, 138–140
  revising functional requirements based on, 144
  and testing, 134
Use case package, 137
Use cases
  alternative formats for, 127–132
  confirming correctness of, 143–144
  and data flow diagrams, 154–164
  defined, 125
  elements of, 127–132
  identification of, 135–140
Use, ease of, 273
User documentation, 397, 398
User effort minimization (interface design), 276
User experience (UX), 269
User interface design, 270–296
  applying concepts of, 305–313
  input design, 292–300
  interface design prototype, 284–286
  interface evaluation, 286–290
  interface standards design, 277, 282–284
  interface structure design, 280
  navigation design, 290–296
  output design, 301–305
  principles for, 270–277
  process of, 277–290
  use scenario development, 278–280
User interfaces, 269
User interface testing, 395, 396
User involvement, in requirements determination, 111
User requirements, 88
  defined, 88, 124
  for methodologies, 42, 50
User role
  in data modeling, 195
  in use cases, 129, 135
Use scenarios, 278–280
Use scenario testing, 395, 396
US Marine Corps, 173

V
Validation
  of data flow diagrams, 172–176
  of entity relationship diagrams, 203–209
  of input design, 300
Valid value, 367
Value
  tangible and intangible, 24
  valid, 367
Value-added contracts, 230, 232
VDI (virtual desktop infrastructure), 245
Versions, 45, 46
Viewpoint, 167, 169, 172, 173
Virtual desktop infrastructure (VDI), 245
Virtualization
  in architecture design, 247
  server, 28
Virus control requirements, 254, 257
Viruses, 253
Visible Analyst, 342
Visual Basic, 325, 344
V-model, 43, 49, 50
Volumetrics, 378, 380

W
Walk-through, 87
Walk-through evaluation, 289
Waterfall development, 42–44, 48–49
Web pages, 284, 285
Weighted alternative matrix, 235
Welch Foods, Inc., 2229
White-box unit testing, 395, 396
White space, 270, 272, 273
Whole-system conversion, 413–415
Wilson, Carl, 41
Wire-flow diagram, 278, 284
Wireframe diagram, 278, 284
Workarounds, 228, 233
Work breakdown structure, 53–54
Work plan, 10
  project work plan, 37, 53–54, 62
  task identification, 53–54

X
XP (extreme programming), 47

Z
Zero client computing, 245