

Index

NUMERICS

37signals, Writeboard, 347
3D object manipulation, 415–420

A

abandoning changes in document, 361
Ableton Live, 257, 462, 471
abstraction, 84
accelerator, 490–491, 555
access key, 491–492
accountability and data entry, 371
action, 122, 409
active validation, 464
activity
 experience level of people performing, 42
 television-based interfaces and, 196–197
 user goals compared to, 15–16
Activity Theory, 15
Activity-Centered Design, 15
adaptive menu, 486–487
additive selection, 393
address book, 36–37
adjacent panes, 233, 234, 428, 429
Adobe Fireworks, 133, 514
Adobe Illustrator
 color mixer and swatches area, 235
 error message dialog box, 229
 modal tools and, 410
 sketches and, 133
Adobe Lightroom
 alignment to grid system, 297
 Develop view, 431, 432
 sidebars, 514–515
Adobe Photoshop
 Brightness & Contrast dialog box,
 430–431
 confirmation dialog box, 543–544
 marquee, 397
 modal tools and, 409–410
 modeless feedback in, 209
 navigating between palette controls in,
 235–236
 Navigator palette, 241
 previews, 314
 Variations interface, 31
aesthetic appeal and grid system, 299
aesthetic-usability effect, 307
affordance, 282–285
AirSet Desktop Sync, 541
alert dialog box, 539–541
Alexander, Christopher
 architectural patterns and, 22, 157
 A Pattern Language, 156
 The Timeless Way of Building, 156
alignment of visual elements, 296–299
Alto system, 423–424
Amazon.com breadcrumb display, 241
animation, 316
annotated scrollbar, 242

- anticipating human need, 253
 - AOL, 435
 - Apple. *See also* Mac OS X
 - iPhoto, 351
 - iPod, 91, 206
 - iPod Shuffle, 205–206
 - iTunes, 181, 351, 524
 - Macintosh, 279–280, 424
 - MacPaint, 396–397, 425
 - appliance, designing for, 198
 - application
 - applying memory to, 266–268
 - consistency and standards across, 319–320
 - daemonic, 172–173, 198
 - document-centric, 168
 - full-screen, 427–428
 - Internet-enabled, designing
 - multipaned, 428–429
 - transient, 170–172
 - Web, designing, 179–181
 - application file, foreign application activity
 - on, remembering, 266
 - application modal dialog box, 509
 - application status, 213–214, 363
 - archetype, 82–83
 - architectural design pattern, 156
 - archiving document, 355
 - The Art and Science of Web Design* (Veen), 175
 - Art Directors Toolkit (Code Line Communications), 171
 - artifact model, 107
 - associative retrieval, 327
 - atomic elements in interaction vocabulary, 280–281
 - atomic grid unit, 297
 - attitude-oriented questions for ethnographic interview, 66
 - attribute, 325
 - attribute-based retrieval, 327–330, 332–333
 - audible feedback, 193, 198, 547–549
 - audible interface, designing for, 199
 - auditing, editing compared to, 371–374
 - AutoCorrect feature (Microsoft Word), 373
 - AutoFormat feature (Microsoft Word), 373
 - automatic save function, 358–359
 - automotive interface, designing for, 197–198
 - auto-scrolling, 402–404
 - avoiding
 - blank slate, 215–216
 - clutter, 307–308
 - control-laden dialog boxes, 439–440, 505
 - hierarchy in user interface, 247–248
 - mode, 425–426
 - questions, 217–219, 256
 - twitchiness in drag-and-drop operation, 404–406, 407
 - unnecessary reporting, 214–215
 - visual noise, 307–308
- ## B
- Backspace key, 344, 345
 - balance and symmetry in visual design, 300–301
 - balloon help, 497
 - bang menu, 488–489
 - baseline grid, 416–417
 - Becker, Marion Rombaur (*The Joy of Cooking*), 560
 - beginner
 - excise and, 225
 - graduating to intermediate user, 553–555
 - intermediate compared to, 42–44
 - mental model and, 46
 - needs of, 45–46

- behavior
 - design of, 11–12, 13
 - idiosyncratically modal, 556–558
 - of radio buttons, 446
 - ranges of, 83
 - visually communicating, 304–305
 - behavior pattern
 - description of, 158
 - ethnographic interviews and, 63
 - identifying significant, 99–100
 - personas and, 76, 82
 - research phase and, 20–21
 - behavioral level of processing, 89–91
 - behavioral principle, 150, 151
 - behavioral variable
 - identifying, 98
 - mapping interview subjects to, 99
 - persona hypothesis and, 61–62
 - bell curve, 42
 - bending rules, 257–259
 - Bertin, Jacques (*The Semiology of Graphics*), 291
 - Beyer, Hugh (*Contextual Design*), 58–59, 84–85, 106, 118
 - BlackBerry (RIM), 188
 - blank slate, avoiding, 215–216
 - blind Undo, 339
 - Blink* (Gladwell), 89
 - blocking bulletin dialog box, 522
 - BMW iDrive system, 197
 - Boolean logic, 34–35, 209
 - bounce, 404
 - bounded entry control, 457–459, 462
 - bounding box, 418
 - brainstorming, 117–118
 - brand guideline, 138
 - brand requirement, 123
 - branding, 275–276, 306–307
 - Brazil* (movie), 32
 - breadcrumb display, 241
 - bridging research-design gap
 - activities for, 109
 - overview of, 18–19
 - requirements, 114–115
 - requirements definition, 115–123
 - scenarios, 110–113
 - Brightness & Contrast dialog box (Adobe Photoshop), 430–431
 - building idioms, 280–282
 - bulletin dialog box, 522–523
 - Bullets and Numbering dialog box (Microsoft Word), 301
 - business decision maker, 566
 - business driver, 53
 - business goal, 14, 95
 - business requirement, 122
 - butcon
 - combutcons, 447–448
 - description of, 495
 - dynamic visual hinting and, 387
 - as imperative controls, 441–442
 - labeling, 496
 - latching, 444–445
 - as memorization vectors, 555
 - radio, 446–447
 - Butler, Jill (*Universal Principles of Design*), 307
 - button. *See also* butcon
 - flip-flop, 445
 - on mouse, 380–382
 - radio, 446–447
 - button controls, 440–441
- ## C
- calendar, 37–40
 - camera movement, 420
 - card sorting, 72
 - caret, 395

- Carroll, John
 Making Use, 111–112
 scenario-based design and, 110, 111–112
- cascading dialog box, 527
- cascading menu, 478, 485–486
- category-specific Undo, 344–345
- causality, showing, 314
- cellular telephone, 190–191, 492
- change over time, showing, 316
- characteristics of persona, 100–101
- charged cursor tool, 410–411
- check box, 443–445, 451
- checkmark menu item, 489
- choice
 providing, 217–219, 256
 remembering, 263–264
- chord-clicking, 384
- Chouard, Yvon (founder Patagonia), 154
- chromostereopsis, 311
- Civilization* (Sid Meier), 545
- clarity of transient application, 170
- Claxton, Guy (*Hare Brain, Tortoise Mind*),
 89
- click target, 194
- clicking with mouse, 383–385
- Close button, 512
- closing document, 352–353
- clue box, 465–466
- clutter, avoiding, 307–308
- Code Line Communications, Art Directors
 Toolkit, 171
- cognition, stimulating, 155
- cognitive dissonance, 33
- cognitive processing, 89
- cognitive work, minimizing, 151
- coherence, internal, 155
- collaboration by designer, 566–567
- color and visual interface design, 292, 302,
 311–312
- color-blindness, 312
- combo box, 467, 499
- combutocon, 447–448
- command, terminating, 508, 511
- command vector, 551–552
- command-line interface, 224–225, 474
- commensurate effort, 245–246
- common sense and considerate product,
 253
- communicating status, 363
- communication
 personas and, 79
 visual interface design and, 288
- Compare function, 343–344
- comparison, enforcing visual, 314
- competitive audit, 57
- complementary colors, 311
- composite archetype, 75–76, 82
- compound, 280–281
- CompuServe Navigator, 434–435, 438
- computer
 interactivity and, 11
 thinking of product as, 183
 as working for human, 368
- computer literacy, 27
- Computers as Theater* (Laurel), 110
- conceptual model, 28–29
- conceptual principle, 150
- conducting ethnographic interview
 methods of, 65–68
 overview of, 63
 phases, teams, and timing of, 64
 team review and, 68
- configuration
 differentiating between command and,
 216–217
 offering option for to user, 555–557
- Confirm File Delete dialog box (Microsoft
 Windows), 541

- confirmation dialog box
 - description of, 539, 541–542
 - eliminating, 543–544
 - human behavior and, 542
- confirmation message
 - bulletin dialog box and, 523
 - as excise, 228–229
- conflating *what* and *how* questions, 114–115
- conflicting interests in development process, 9
- connection, 420–421
- conscientiousness of considerate product, 253–254
- consensus and persona, 79
- considerate product
 - as anticipating human needs, 253
 - characteristics of, 251
 - as conscientious, 253–254
 - as deferential, 252
 - as failing gracefully, 256–257
 - as forthcoming, 252–253
 - as keeping mum about problems, 254–255
 - as keeping user informed, 255
 - as knowing when to bend rules, 257–259
 - as not asking a lot of questions, 256
 - overview of, 250
 - as perceptive, 255–256
 - as self-confident, 256
 - as taking interest, 251–252
 - as taking responsibility, 259
 - as using common sense, 253
- consistency in design, 317–320
- Constantine, Larry
 - Software for Use*, 43
 - on user role, 84
- constrained drag, 412
- constraint, technical, 53
- constructing
 - context scenario, 119–122
 - key path scenario, 133–135
- constructing persona
 - checking for completeness and redundancy, 101–102
 - designating types, 104–106
 - expanding description of, 102–103
 - identifying behavioral variables, 98
 - identifying significant behavior patterns, 99–100
 - mapping interview subjects to behavioral variables, 99
 - steps for, 97–98
 - synthesizing characteristics and relevant goals, 100–101
- content
 - in dialog boxes, managing, 523–528
 - quality, relevance, and integrity of, ensuring, 315–316
- context
 - definition of, 122
 - designing to meet goals in, 16–17
 - as driving design, 185
- context scenario
 - constructing, 119–120
 - description of, 112–113
 - example of, 120–121
 - requirements definition and, 22
- Contextual Design* (Beyer and Holtzblatt), 58–59, 84–85, 106, 118
- contextual inquiry, 58–59
- contextual toolbar, 503
- contextualizing information, 210–213
- contiguous selection, 392–393
- contrast, 312
- control integration, 196

control manipulation, 408–409
 control panel, 173
 controls. *See also* selection controls
 avoiding control-laden dialog boxes, 439–440, 505
 display, 468–472
 entry, 457–468
 imperative, 440–443
 keeping to minimum, 238
 mapping to functions, 242–245
 onscreen, 312
 types of, 439
 convergence device, 189
 Cooper, Alan
 Communication Play, 316
 customer-relationship management application, 516
 GettyGuide kiosk, 192
 rich visual modeless feedback, 546
 smart desktop phone design, 184
 Softtek Storage Manager, 334
 copy, creating, 359
 Corel Painter, 433
 Cronin, Dave (designer), 115
 Csikszentmihalyi, Mihaly (*Flow: The Psychology of Optimal Experience*), 201
 cursor
 pointing and, 386–390
 selection and, 390–396
 cursor hinting, 382, 388–389, 400
 customer, integrating into design process, 10
 customer experience, brand, and user interface, 306–307
 customer goals, 95
 customer interview, 55
 customer persona, 84, 105
 customer requirement, 123
 customizable toolbar, 501–502

D

daemoniac posture, 172–173
 data
 integrating text, graphics, and, 315
 out of bounds, handling, 466
 qualitative, inferring goals from, 88–89
 quantifiable, showing, 317
 data element
 defining, 128
 grouping, 130–131
 data entry. *See also* input
 auditing compared to editing, 371–374
 fudgeability and, 371
 in lists, 455
 missing data, 369–371, 532–533
 data immunity, 368–369
 data integrity, 367–368
 data requirement, 122
 data retrieval
 attribute-based, 327–330
 digital methods of, 327
 in digital world, 326–330
 indexed, 325–326
 by location, 324–325
 natural language output and, 333–334
 overview of, 323
 database
 completeness of, 232
 querying, 334
 retrieving information from, 330–333
 debounce, 404–405
 decision-set reduction, 267–268
 deduced information, remembering, 265
 default, remembering, 263–264
 defining
 industrial design framework, 139–140
 interaction framework, 127–136
 visual design framework, 136–139

- degree
 - of dislocation, 246
 - of risk exposure, 247
- deleted data buffer, 346
- del.icio.us, 329
- DeMarco, Tom (*Peopleware: Productive Projects and Teams*), 201
- demographic variable, 61–62, 98
- depthcueing, 416–417
- desensitizing mouse, 407–408
- design. *See also* design principles; designer;
designing; goal-directed design
 - definition of, 4
 - letting context drive, 185
 - in manufacturing, evolution of, 11–12
 - to meet goals in context, 16–17
 - as product definition, 18
 - scenarios in, 111–112
 - translating research into, 19
- design communicator, 133
- design framework. *See also* interaction framework
 - description of, 125–126
 - industrial, 126, 139–140
 - interaction, defining, 127–128
 - visual, 126, 136–139, 195
- The Design of Everyday Things* (Norman), 282, 283, 553
- design principles
 - behavioral and interface-level, 151
 - by chapter, 569–574
 - description of, 149, 150
 - for embedded systems, 182–188
 - levels of detail and, 150
- design team, size of, 59
- design values
 - description of, 150, 151–152
 - elegant, 154–155
 - ethical, 152
 - harm, minimizing, 152–153
 - human situations, improving, 153
 - pragmatic, 154
 - purposeful, 153
- Design Within Reach Web site, 239
- designer
 - alert dialog boxes and, 540
 - collaboration by, 566–567
 - as researcher, 18–19
 - usability testing and, 145–146
 - user as, 67
- designing. *See also* harmonious interaction, designing
 - for appliance, 198
 - for audible interface, 199
 - for automotive interface, 197–198
 - for behavioral response, 90–91
 - desktop software, 163–168
 - embedded system, 182–188
 - for handheld, 189–191
 - informational Web site, 175–176
 - Internet-enabled application, 181
 - for kiosk, 191–195
 - for reflective response, 91
 - for television-based interface, 195–197
 - transactional Web site, 177–178
 - Undo system, 337–338
 - for visceral response, 90
 - for Web, 174–175
 - Web application, 179–181
- Designing Interfaces* (Tidwell), 157
- Designing Visual Interfaces* (Mullet and Sano), 205, 288
- desire, 155
- desktop software, designing, 163–168
- development process
 - conflicting interests in, 9
 - evolution of, 6
 - successful, 12
 - user goals and, 9–10

- development support phase of
 - goal-directed design, 23
- Dewey Decimal System, 325–326
- diagonal axial symmetry, 300
- dial, 460–461
- dialog box. *See also* error message;
 - specific dialog boxes*
 - alert, 539–541
 - appropriate uses for, 505–507
 - beginners and, 46
 - bulletin, 522–523
 - cascading, 527–528
 - confirmation, 541–544
 - content in, 523–528
 - control-laden, avoiding, 439–440, 505
 - error, 529–538
 - expanding, 526–527
 - function, 517–518
 - guidelines for, 507–508
 - modal, 509
 - as modal technique, 208
 - modeless, 509–516
 - print, 216
 - process, 518–521
 - property, 516–517
 - providing choices instead of, 217–219
 - replacing with rich modeless feedback, 544–549
 - reporting normalcy with, 215
 - as room, unnecessary and necessary, 430–434
 - tabbed, 523–526
 - telling to go away, 231
 - as transient application, 172
- diary study, 71
- differentiating
 - between command and configuration, 216–217
 - probable from possible, 209–210, 351
- digital product
 - as assuming technological literacy, 7
 - building successful, 12
 - conflicting interests and, 9
 - creation of, 4–5
 - development process and, 3–4, 5, 6
 - as exhibiting poor behavior, 8
 - as ignorant about users, 8–9
 - lack of process and, 9–10
 - planning and designing, 13
 - as requiring humans to do heavy lifting, 8
 - as rude, 5, 7
 - successful, 25–26
 - task-based focus of, 15
- digital retrieval methods, 327
- digital soup, 332–333
- direct manipulation
 - controls, 408–409
 - cursor, 386–396
 - description of, 375–377
 - drag and drop, 396–408
 - menus and, 479
 - object connection, 420–421
 - objects, 411–420
 - palette tools, 409–411
 - pointing devices, 377–386
 - selection, 390–397
 - toolbars and, 479
- direct manipulation idioms, 207, 213
- disabled menu item, 489
- disabling toolbar controls, 498
- discrete selection, 392–393
- disk
 - file storage system on, 326
 - help with, 264
 - purpose of, 364–365
- Disk Properties dialog box (Windows), 317
- dislocation, degree of, 246

- dismissing confirmation message, 542
- Disney.com home page, 227
- display controls
 - description of, 439
 - drawers and levers, 472
 - scrollbars, 469–471
 - splitters, 471–472
 - text, 468–469
- display density of embedded system, 187–188
- division of labor in computer age, 249–250, 368
- docking toolbar, 500, 513
- document
 - abandoning changes in, 361
 - archiving, 355
 - closing, 352–353
 - creating copy of, 359
 - creating version of, 361
 - format of, specifying, 360–361
 - naming, 353, 359
 - placing and moving, 360
 - renaming, 354, 359
 - reversing changes in, 361
 - saving, 358–359
- document navigator, 471
- document-centric application, 168
- domain expertise, 62
- domain knowledge, 282
- Don't Make Me Think!* (Krug), 175
- double-clicking with mouse, 384
- drag pliancy, indicating, 400–401
- drag rectangle, 394
- drag threshold, 404–406, 407, 419
- drag-and-drop operation
 - auto-scrolling, 402–404
 - fine scrolling, 406–408
 - lists and, 452–453
 - overview of, 396–398
 - on touch screens, 194

- twitchiness, avoiding, 404–406, 407
- visual feedback for, 399–402
- dragging. *See also* drag-and-drop operation
 - double-clicking and, 386
 - with mouse, 383
- drawer, 472
- drop candidate, 399, 401
- drop-down list control, 449, 467
- drop-down menu, 478
- Dubberly, Hugh (designer), 151
- dynamic visual hinting, 387–388

E

- earmarking, 450–452
- economy of form, 154
- edge case, 80
- edge case use scenario, 136
- Edit menu, 481, 482
- effectiveness
 - design and, 16–17
 - persona and, 79
- efficiency. *See also* productivity
 - data entry and, 368, 373–374
 - grid system and, 299
 - visual design and, 308
- ejector seat lever, hiding, 219–220
- elastic user, 79–80
- electronic mail, storing and retrieving, 331–333
- elegant interaction design, 154–155, 205
- eliminating
 - confirmation dialog boxes, 543–544
 - error messages, 534–536
- embedded object and Undo feature, 338
- embedded system, general design
 - principles for, 182–188
- emotion, stimulating, 155
- Emotional Design* (Norman), 89, 90, 91, 92

- empathy, 81
- end goal, 93, 100–101
- entering data. *See* data entry
- entry controls
 - bounded and unbounded, 457–459, 462–465
 - clue boxes, 465–466
 - description of, 439
 - dials and sliders, 460–461
 - spinners, 459–460
 - text edit, 463–468
 - thumbwheels, 462
- environment for ethnographic interview, 65
- environmental context, 185
- environmental variable, 62
- error dialog box. *See* error message
- error message
 - bulletin dialog box and, 523
 - eliminating, 533–536
 - as excise, 228–230
 - improving, 537–538
 - number of, 530
 - problems with, 530–532
 - as rude, 5, 7
 - as unnecessary dialogue, 207
 - when renaming file, 354
 - ethical interaction design, 152
 - ethnographic field study, 20
 - ethnographic interview
 - conducting, 63–68
 - overview of, 58–59
 - preparing for, 59–63
 - task analysis and, 73
 - Evenson, Shelley (author), 110
 - evolution
 - of design in manufacturing, 11–12
 - of software development process, 6
 - of toolbars, 499–503
 - excise
 - asking permission as, 230–231
 - beginner and, 225
 - common traps, 231–232
 - definition of, 223–224
 - determining, 228
 - expert user and, 225
 - flow and, 228–231
 - in GUI, 224–228
 - navigation as, 232–237
 - pure, 226
 - visual, 226–227
 - excise task, 223–224
 - expanding dialog box, 526–527
 - experience goal, 92–93
 - experience keyword, 138
 - experience level. *See also* beginner; expert user; intermediate user
 - designing for, 44–48
 - user interface and, 41–44
 - experience requirement, 123
 - expert review, 57
 - expert user
 - description of, 42–43
 - excise and, 225
 - needs of, 47
 - usability testing and, 71
 - explanatory Undo, 339
 - explorational kiosk, 192, 193, 195
 - Explorer (Windows), 212–213
 - extending metaphor, 278

F

 - failing gracefully, 256–257
 - feedback. *See also* modeless feedback;
visual feedback
 - audible, 193, 198, 547–549
 - positive and negative, 536
 - field in database, 331

- file, help with, 264
 - file folder metaphor, 278
 - file location, remembering, 265
 - File menu
 - changing name and contents of, 357, 362–363
 - example of, 481, 482, 483
 - file system
 - implementation model and, 352–355, 365
 - mental model and, 355–357
 - problems with, 349–350
 - saving changes and, 350–351
 - unified file model, 357–363
 - Find dialog box (Microsoft Word), 526–527
 - findability, 174
 - fine scrolling, 406–408
 - flexibility, 369–370
 - Flickr, 180, 329
 - flip-flop button, 445
 - flip-flop menu item, 489
 - floating palette, 513
 - floating toolbar, 500
 - floor grid, 417
 - flow
 - description of, 201–203
 - dialog boxes and, 505–506, 539–540
 - excise and, 228–231
 - of visual elements, 296–301
 - Flow: The Psychology of Optimal Experience* (Csikszentmihalyi), 201
 - fly-over facility, 497
 - focus group, 69
 - folksonomy, 329
 - font, 310, 313
 - Font dialog box (Microsoft Word), 517
 - Fore, David (designer), 151
 - foreign application activity, remembering, 266
 - form and behavior specification, 23
 - form compared to function, 306
 - form factor
 - collaborating with interaction designers
 - about, 139–140
 - defining, 127
 - framework definition phase and, 23
 - form in Visual Basic, 436
 - form language study, developing, 140
 - Format menu, 484–485
 - format of document, specifying, 360–361
 - formative evaluation, 144–145
 - frame, 429
 - framework definition phase of goal-directed design, 21, 22–23
 - freezing, 348
 - frequency of use, 246
 - fudgeable system, 258–259, 371
 - fulfilling user expectations of manual affordance, 284–285
 - full-resolution screen depicting user interface, 141
 - full-screen application, 427–428
 - function
 - differentiating between configuration of function and, 216–217
 - integrating style and, 306–307
 - mapping control to, 242–245
 - requirement compared to, 114
 - function dialog box, 517–518, 523
 - functional element, defining and grouping, 128–131
 - functional requirement, 122
- ## G
- gallery of ready-to-use templates, 559–560
 - Gamma, Erich (author), 22
 - Gates, Bill (chairman of Microsoft), 424, 427
 - General Magic, Magic Cap, 276–277, 562

- GettyGuide kiosk, 192
 - Gilliam, Terry (movie director), 32
 - Gladwell, Malcolm (*Blink*), 89
 - global metaphor, 276–279
 - globalization, 558–559
 - goal-directed design
 - bridging gap between research and design, 18–19
 - design methods, 3–10
 - development support phase of, 23
 - evolution of design in manufacturing, 11–12
 - framework definition phase of, 21, 22–23
 - interaction design, 13
 - modeling phase of, 21, 76
 - practices of, 565–567
 - process of, 17–18, 20, 24
 - refinement phase of, 23, 141–142
 - requirements definition phase of, 21–22, 114–123
 - research phase of, 20–21
 - success and, 25–26
 - user goals, recognizing, 13–17
 - goal-oriented questions for ethnographic interview, 66
 - goals. *See also* user goals
 - business, 14, 95
 - customer, 95
 - definition of, 15
 - ethnographic interview and, 66–67
 - inferring from qualitative data, 88–89
 - organizational, 95
 - personas and, 83–84, 88
 - synthesizing, 100–101
 - technical, 96
 - television-based interfaces and, 196–197
 - types of, 94–96
 - usage patterns and, 88
 - golden section, 298
 - Goodwin, Kim (designer), 97, 115, 151
 - Google
 - Finance, 241, 315
 - search interface, 205, 206
 - SketchUp, 418
 - Gradient tool (Adobe Photoshop), 236
 - graphic design and user interface, 289
 - graphical input, providing, 213
 - graphical overview, 241
 - graphical user interface. *See* user interface
 - graphics, integrating text, data, and, 315
 - Greenwood, Wayne (designer), 115
 - grid system, 297–299
 - group multiple Undo, 342–343
 - group selection, 394
 - grouping elements
 - in interaction framework, 130–131
 - in visual interface design, 294–296
 - Grudin, Jonathan (author), 81–82
 - GUI. *See* user interface
 - guidelines, 417
 - guides, 412–413
- ## H
- Halley, Lane (designer), 97, 115
 - handheld
 - designing for, 189–191
 - environmental context and, 185
 - limiting scope of, 186
 - menus on, 492
 - visual interface design for, 312–313
 - handles, 396, 411, 413–415
 - hard-hat item, 485
 - hardware design, integrating software design and, 183–184
 - Hare Brain, Tortoise Mind* (Claxton), 89
 - harm, minimizing, 152–153
 - harmonious interaction, designing
 - blank slates, avoiding, 215–216
 - choices, providing, 217–219
 - contextualizing information, 210–213

- differentiating between command and configuration, 216–217
- direct manipulation, providing, 213
- ejector seat levers, hiding, 219–220
- enabling users to direct, 206–207
- forgiveness, asking for, 216
- keeping tools close at hand, 207–208
- less as more, 204–206
- mental model, following, 203–204
- modeless feedback, providing, 208–209
- normalcy, reporting, 215
- object and application status, reflecting, 213–214
- probable, designing for, 209–210
- reporting, avoiding unnecessary, 214–215
- responsiveness, optimizing for, 220–221
- strategies for, 203
- Harmony remote control (Logitech), 197
- HCI (Human-Computer Interaction)
 - community, 111
- head, information in, 553
- head vector, 553–554
- heads-up display, 209
- Help menu. *See also* online help
 - adding Shortcuts option to, 554
 - description of, 483–484
 - as standard, 481
- heuristic review, 57
- hierarchy in user interface, avoiding, 247–248
- hierarchy of elements
 - in interaction framework, 130–131
 - in visual interface design, 294–296
- Hog Bay Software, WriteRoom, 206
- Holden, Kritina (*Universal Principles of Design*), 307
- Holtzblatt, Karen (*Contextual Design*), 58–59, 84–85, 106, 118
- Horton, William (*The Icon Book*), 302
- hotspot, 386
- hue and visual interface design, 292
- human situation, improving, 153
- Human-Computer Interaction (HCI)
 - community, 111
- hyperlink, 442–443
- I**
- icon. *See also* butcon
 - for daemon application, 173, 198
 - design and rendering of, 302, 303–304
 - function-oriented, 302–303
 - on menus, 490
 - on toolbars, 495–496
- The Icon Book* (Horton), 302
- identifying
 - behavioral variables, 98
 - candidates for ethnographic interview, 60–62
 - persona expectations, 118–119
 - requirements, 122–123
 - significant behavior patterns, 99–100
- identity retrieval, 327
- idiocy, stopping proceedings with, 228–231, 530
- idiomatic interface, 273–276
- idioms
 - building, 280–282
 - menu, 485–492
- idiosyncratically modal behavior, 556–558
- idle time, using, 253, 260–261
- iDrive system (BMW), 197
- imagery in visual design
 - associating symbol to object, 303
 - function-oriented icons, 302–303
 - overview of, 302
 - rendering, 303–304
 - visualizing behaviors, 304–305
- immediate menu, 488–489
- immediate vector, 552

- imperative controls
 - butcons, 441–442
 - buttons, 440–441
 - description of, 439, 440
 - hyperlinks, 442–443
- implementation model
 - description of, 18, 27–28, 30
 - file system and, 349–350, 352–355, 365
 - mathematical thinking and, 34–35
 - mental model compared to, 29, 355–356
 - mistakes and, 336
 - revealing to users, 542
 - software and, 32–35
 - user interface and, 32–33
- implementation-centric interface, 270–271
- improving. *See also* navigation, improving
 - error messages, 537–538
 - human situation, 153
- incremental action, undoing, 338, 344–345
- index to online help, 560
- indexed retrieval, 325–326, 332
- industrial design, 290
- industrial design framework, 126, 139–140
- inferring goals from qualitative data, 88–89
- inflecting interface to match user needs, 245–247
- information
 - contextualizing, 210–213
 - deduced, remembering, 265
 - navigation of, 236–237
 - offering potentially useful, 252–253
 - in world and in head, 553
- Information Architecture* (Rosenfeld and Morville), 175
- information-age represented model, 36
- informational Web site, 175–176
- inheritance, 308
- input. *See also* data entry
 - allowing wherever there is output, 231
 - complexity of, 188, 193–194
 - graphical, providing, 213
 - out-of-sequence, 532
 - rich, sovereign interface and, 167–168
- input method
 - collaborating with interaction designers
 - about, 139–140
 - defining, 127–128
- input vector, 23
- Insert menu, 484
- insert mode, 467
- insertion point, 395–396
- insertion target, 401
- instinct and learning, 273
- integrating hardware and software design, 183–184
- “intelligent” agent, 562–563
- interaction design. *See also* harmonious interaction, designing; principles of interaction design
 - description of, 13
 - effectiveness and, 16–17
 - narratives and, 110–111
 - practice of, 565–567
- interaction design pattern, 22
- interaction framework
 - defining, 127–136
 - description of, 22
 - form factor, posture, and input methods,
 - defining, 127–128
 - functional and data elements, defining, 128–130
 - functional groups and hierarchy, determining, 130–131
 - key path scenario, constructing, 133–135
 - sketching, 131–133
 - validation scenario, checking designs
 - with, 135–136

- interaction framework definition, 22
- interactivity, 11
- interface. *See also* user interface; visual
 - interface design
 - audible, designing for, 199
 - automotive, designing for, 197–198
 - Lotus 1-2-3, 476–477
 - metaphoric, 271–273
 - posture of, 162–163
 - pretending it's magic, 121–122
 - primary persona and, 104
 - television-based, designing for, 195–197
 - visualizing, 131–133
 - interface-level principle, 150, 151
 - intermediate user
 - commensurate effort and, 245–246
 - description of, 42–44
 - graduating from beginner to, 553–555
 - metaphors and, 272
 - needs of, 47–48
 - sovereign posture and, 165
 - toolbars and, 240
 - usability testing and, 71
 - Internet-enabled application, 181
 - interview. *See also* ethnographic interview
 - of customers, 55
 - of stakeholders, 52–54
 - of subject matter experts, 54–55
 - of users and potential users, 56
 - interview subject, mapping to behavioral variables, 99
 - intranet, 181–182
 - intuition, 271–272, 273
 - iPod (Apple), 91, 206
 - iPod Shuffle (Apple), 205–206
 - irreversible action, hiding commands for, 220
- J**
 - Jobs, Steve (chairman of Apple Computer), 424
 - The Joy of Cooking* (Rombaur and Becker), 560
- K**
 - Keeley, Larry (designer), 11
 - key path, 23
 - key path scenario, 113, 133–135
 - key path variant scenario, 135
 - keyboard shortcut, 490–491
 - kiosk
 - designing for, 191–195
 - environmental context and, 185
 - text input and, 188
 - Klein, Gary (*Sources of Power*), 89
 - Korman, Jonathan (designer), 151
 - Krug, Steve (*Don't Make Me Think!*), 175
 - Kuniavsky, Mike (*Observing the User Experience*), 69, 71
- L**
 - labeling butcon, 496
 - language, visual, 302, 311
 - last in, first out (LIFO), 340, 341
 - latching butcon, 444–445
 - latency, accommodating, 220–221
 - Laurel, Brenda
 - Computers as Theater*, 110
 - on context, 16
 - on metaphors, 279
 - leading question, 68
 - learning
 - idiomatic interface and, 274, 275
 - instinct, intuition, and, 273
 - master-apprentice model of, 58

- left mouse button, 380
 - less, as more, 204–206
 - lever, 472
 - leverage, 309
 - library card catalog, 325–326
 - LibraryThing, 329–330
 - Lidwell, William (*Universal Principles of Design*), 307
 - life goal, 93–94, 101
 - LIFO (last in, first out), 340, 341
 - link, 442–443
 - linking, 236, 237
 - list controls
 - dragging and dropping from lists, 452–453
 - earmarking, 450–452
 - entering data into lists, 455
 - horizontal scrolling, 454–455
 - ordering lists, 453–454
 - overview of, 449–450
 - Lister, Timothy (*Peopeware: Productive Projects and Teams*), 201
 - literature review, 57
 - localization, 558–559
 - location
 - of ethnographic interview, 65
 - of kiosks, 193
 - logical mapping, 243, 244–245
 - logical path, creating, 299–300
 - logical zoom, 237
 - Logitech Harmony remote control, 197
 - Lotus 1-2-3 interface, 476–477
- M**
- Mac OS X (Apple)
 - Automator, 398
 - icons, 304
 - Spotlight search capability, 261, 328–329
 - Macintosh (Apple), 279–280, 424
 - MacPaint (Apple), 396–397, 425
 - Macromedia Fireworks, tool palette, 301
 - Magic Cap (General Magic), 276–277, 562
 - Making Use* (Carroll), 111–112
 - manifest model
 - implementation model and, 248
 - of Undo facility, 341, 343
 - manual affordance, 283–285
 - manufacturing, evolution of design in, 11–12
 - mapping
 - control to function, 242–245
 - interview subject to behavioral variables, 99
 - market demographics, 69–70
 - market segment, 86, 87
 - market segmentation, 17, 69–70
 - marquee, 397
 - master-apprentice model of learning, 58
 - mathematical thinking and
 - implementation model, 34–35
 - maximizing
 - document view, 168
 - sovereign program, 164, 166
 - windows, 436
 - MDI (multiple document interface), 437–438
 - mechanical-age represented model, 35–40
 - The Media Equation* (Nass and Reeves), 218, 249, 250
 - Meier, Sid, *Civilization*, game of, 545
 - memorization vector, 554–555
 - memory. *See also* remembering
 - for actions, 265–266
 - applying to applications, 266–268
 - considerate product and, 252
 - disks compared to, 364
 - smart products and, 261–263
 - transient application, 172
 - memory work, minimizing, 151

- mental model
 - audible interfaces and, 199
 - beginners and, 46
 - description of, 28–29
 - file system and, 356–357
 - harmonious interaction and, 203–204
 - implementation model compared to, 29, 355–356
 - of mistakes, 336
 - persona expectations and, 118–119
 - represented model and, 30–32
 - storage systems and, 247–248
 - user interface and, 31
- menu bar, 478
- menu mode, 408–409
- menus
 - beginners and, 46
 - clicking and dragging, 408–409
 - drop-down and pop-up, 478
 - Edit, 482–483
 - File, 357, 362–363, 481, 482, 483
 - Format, 484–485
 - Help, 481, 483–484, 554
 - history of, 473–478
 - idioms, 485–492
 - Insert, 484
 - navigation and, 235–236, 240
 - optional, 483–485
 - on other platforms, 492
 - pedagogic vector and, 479–481
 - sequential hierarchical, 474–476
 - standard, 481–484
 - toolbars and, 494–495, 499–500
 - Tools, 485
 - View, 484
 - visible hierarchical, 476–477
 - Windows, 483
- meta-key, 381–382
- metaphor in user interface
 - excise and, 226
 - finding good, 276
 - global, 276–279
 - limitations of, 272
 - problems with, 37, 269–270
 - storage system, 247
 - visual, 425
- metaphoric interface, 271–273
- method acting, 81–82
- methods of ethnographic interviewing, 65–68
- Microsoft. *See also* Microsoft Outlook; Microsoft PowerPoint; Microsoft Word; Windows (Microsoft)
 - Clippy, 252–253, 562
 - cursor hinting, 400
 - Excel, 234, 389
 - Explorer, process dialog box, 520
 - Internet Explorer, 521
 - MDI and SDI, 437–438
 - tiled windows, 427
 - Visio, 133
- Microsoft Outlook
 - error message dialog box, 229–230
 - as multipaned application, 429
 - as sovereign posture, 164
 - structural pattern of, 158
- Microsoft PowerPoint
 - adaptive menu, 487
 - creating new presentation in, 215
 - freeform objects, 415
 - handles, 414
 - interface structure of, 320
 - ribbon, 488
 - sketches and, 133
- Microsoft Word
 - annotated scrollbar, 242
 - as assuming technology literacy, 7

- Microsoft Word (*continued*)
 - auditing and, 372–373
 - AutoCorrect feature, 373
 - AutoFormat feature, 373
 - Bullets and Numbering dialog box, 301
 - creating blank document in, 215
 - as exhibiting poor behavior, 8
 - File menu, 483
 - Find dialog box, 526–527
 - Font dialog box, 517
 - group multiple Undo, 342–343
 - modeless feedback in, 208
 - Options dialog box, 526
 - Print Preview view, 305
 - print setup dialog box, 217
 - ribbon, 502
 - Save Changes dialog box, 350–351
 - toolbars, 167–168, 217
 - unnecessary dialog box in, 210
 - Word Count toolbar, 208–209
- middle mouse button, 381
- milestoning, 347
- minimal working set, 552
- minimalist approach to product design, 204–206
- minimizing
 - harm, 152–153
 - input complexity, 188
 - windows, 436
 - work with behavioral and interface-level principles, 151
- missing data, 369–371, 532–533
- mistakes. *See also* error message
 - in data entry, 371–374
 - mental models of, 336
 - users and, 335–336
- mnemonic, 491–492, 555
- modal dialog box, 509
- modal tool, 409–410
- mode, avoiding, 425–426
- model. *See also* persona; *specific models*
 - description of, 75
 - market segment, 86, 87
 - purpose of, 76
 - user profile, 85–86
 - user role, 84–85
- modeless dialog box
 - description of, 509–510
 - problems with, 510
 - solutions for, 510–516
- modeless feedback
 - data entry and, 370
 - in Microsoft Word, 372–373
 - providing, 208–209, 255
 - replacing dialog boxes with, 544–549
- modeling phase of goal-directed design, 21, 76
- mode/modal behavior, 186, 197
- modular layout grid, 299
- monocline grouping, 247, 248
- Morville, Peter
 - findability and, 174
 - Information Architecture*, 175
- motivation, 83–84, 94
- Motorola Razr phone, 205
- mouse
 - buttons on, 380
 - desensitizing, 407–408
 - pointing and clicking with, 382–385
 - using, 378–380
- mouseover facility, 497
- mouse-up and mouse-down events, 385–386
- movable toolbar, 500–501
- moving file, 360
- Mullet, Kevin (*Designing Visual Interfaces*), 205, 288
- multipaned application, 428–430
- multiple command vectors, 551–552

- multiple document interface (MDI),
 - 437–438
- multiple Undo
 - description of, 339
 - limitations of, 340
 - model problems of, 341
- multiple viewpoints, 416
- multisession undo, 265–266
- mutual exclusion, 393, 446

N

- naming file, 353, 359
- Nardi, Bonnie (designer), 15
- narrative
 - persona descriptions and, 102–103
 - scenarios and, 110–111
- Nass, Clifford (*The Media Equation*), 218, 249, 250
- Native Instruments, Reaktor, 461
- natural language output, 333–334
- navigation. *See also* navigation, improving
 - among multiple screens, views, or pages, 233
 - audible interfaces and, 199
 - display density and, 187–188
 - as excise, 232–237
 - of information, 236–237
 - integration of functionality and, 189
 - mouse, keyboard, and, 380
 - between panes, 233–235
 - television-based interfaces, 196
 - between tools and menus, 235–236
- navigation, improving
 - hierarchies, avoiding, 247–248
 - inflecting interface to match user needs, 245–247
 - mapping controls to function, 242–245
 - overview of, 237
 - overviews, providing, 241–242

- reducing number of places to go, 238
- signposts, providing, 238–240
- navigational trauma, 233
- necessary use scenario, 135
- need, requirement compared to, 114
- negative feedback, 536, 547–548
- negative persona, 106
- Nelson, Ted, on idiomatic design, 273
- Nielsen, Jakob
 - on standards, 317, 318
 - Usability Engineering*, 71, 144
 - useit.com Web site, 175
- nonuser, persona as representing, 84
- Norman, Donald
 - Activity-Centered Design and, 15
 - ad hoc personas and, 86
 - The Design of Everyday Things*, 282, 283, 553
 - designer's model and, 29
 - Emotional Design*, 89, 90, 91, 92
 - on errors in product design, 529
 - on natural mapping, 243
 - on pile cabinet, 248
 - system model and, 28

O

- object
 - associating visual symbol to, 303
 - persistent, 219, 239–240
 - requirements and, 122
 - rotation of, 420
- object connection, 420–421
- object hinting, 387–388
- object manipulation
 - repositioning, 411–413
 - resizing and reshaping, 413–415
 - 3D, 415–420
- object status, reflecting, 213–214
- object-verb ordering, 390–392

- observation, of user, 56–57
 - Observing the User Experience* (Kuniavsky), 69, 71
 - OmniGraffle, 133, 413
 - online help. *See also* Help menu
 - beginners and, 46
 - index to, 560
 - “intelligent” agents, 562–563
 - intermediates and, 47
 - modeless and interactive, 561
 - options for, 561
 - wizards, 561–562
 - onscreen controls, 312
 - operation of handheld device, 189–190
 - Options dialog box (Microsoft Word), 526
 - orbit, 419
 - orchestration, 202–203
 - ordering list, 453–454
 - organizational goals, 95
 - Organize tool (Flickr), 180
 - org-chart centric interface, 271
 - orientation and visual interface design, 292
 - ornamentation, excessive, 227
 - out-of-sequence input, 532
 - output, using text edit controls for, 468
 - overlapping
 - toolbars, 501
 - windows, 426–427
 - overtyping mode, 467
 - overview, providing, 241–242
 - overview option for online help, 561
- P**
- PACs (picture archiving and communication systems), 181
 - pages, navigation among, 233
 - Paint Bucket tool (Adobe Photoshop), 236
 - palette, floating, 513
 - palette tools, 409–411
 - Palm Treo smartphone, 7, 186–187, 188
 - Palo Alto Research Center (PARC), 279, 423–427
 - panes, 233–235, 238
 - panning, 237
 - Papanek, Victor (industrial designer), 4
 - Paper Prototyping* (Snyder), 126, 144–145
 - paradigms in design of user interface
 - idiomatic, 273–276
 - implementation-centric, 270–271
 - metaphoric, 271–273
 - PARC (Palo Alto Research Center), 279, 423–427
 - partner requirement, 123
 - passive validation, 465
 - past data entry, remembering, 266
 - pattern. *See also* behavior pattern
 - interaction, 130
 - remembering, 264
 - pattern language, 157
 - A Pattern Language* (Alexander), 156
 - pattern library or catalog, 157
 - patterns of interaction design
 - architectural patterns compared to, 156
 - description of, 149, 156
 - recording and using, 157
 - types of, 158–159
 - pedagogic vector
 - description of, 552
 - dialog boxes and, 507
 - menus and, 479–481
 - Peopleware: Productive Projects and Teams* (DeMarco and Lister), 201
 - perception of user
 - of response time, 221
 - by stakeholders, 54
 - perceptiveness of considerate product, 255–256
 - permission, making user ask, 230–231
 - perpetual intermediate, 43. *See also* intermediate user

- persistent object, 219, 239–240
- persona. *See also* constructing persona
 - advantages of, 77–78
 - as based on research, 80–81
 - business or social relationships of, 101
 - customer, 105
 - description of, 75–76
 - edge case and, 80
 - elastic user and, 79–80
 - in goal-directed design, 20–22
 - market segments and, 86, 87
 - motivations and, 83–84
 - negative, 106
 - primary, 104–105
 - provisional, 86–88
 - ranges of behavior and, 83
 - as representing groups, 82
 - as representing individuals, 81–82
 - as representing nonusers, 84
 - reusing, 82
 - secondary, 105
 - self-referential design and, 80
 - served, 106
 - stereotype compared to, 82–83
 - strengths of, 78–79
 - supplemental, 105
 - user profile compared to, 85–86
 - user role compared to, 85
 - using in scenarios, 112
 - working sets and, 552–553
- persona description, 102–103
- persona hypothesis, 60
- personalization, 555–557
- personification, 81
- photograph of persona, 103
- photographic icon, 304
- physical mapping, 243, 244
- physical model, 107
- physical work, minimizing, 151
- picking problem, 419
- picture archiving and communication systems (PACSs), 181
- pigment application, undoing, 345
- placing file in directory, 353, 360
- planning for ethnographic interview, 63
- platform
 - decisions about, 163
 - description of, 161
 - menus and, 492
 - posture and, 162
- pliant response hinting, 385, 386–387
- pluralized window, 190, 436–437
- pointing
 - with cursor, 386–390
 - with mouse, 382–383
- pointing device, 377–378. *See also* cursor; mouse
- pole, 416–417
- polyline, 414–415
- pop-up menu, 478
- pop-up window, 190
- position and visual interface design, 293
- positional retrieval, 327
- positive feedback, 536, 548–549
- possible, segregating probable from, 209–210, 351
- postural pattern, 158
- posture
 - daemoniac, 172–173
 - defining, 127
 - description of, 161–162
 - desktop applications and, 163–164
 - for handheld devices, 190–191
 - for informational Web sites, 175–176
 - for kiosks, 194–195
 - platform and, 162
 - sovereign, 164–168
 - for transactional Web sites, 177–178
 - transient, 169–172
 - for Web applications, 179–181

practice of interaction design, 565–567
pragmatic interaction design, 154
predicting what user will do, 261–263, 268
preference threshold, 268
pretending
 interface is magic, 121–122
 system is human, 129–130
primary persona, 104–105
primitive, 280–281
principles, interaction, 130
principles of interaction design
 behavioral and interface-level, 151
 by chapter, 569–574
 description of, 149, 150
 for embedded systems, 182–188
 levels of detail and, 150
print dialog box, 216
Print Preview view (Microsoft Word), 305
probable, segregating possible from,
 209–210, 351
problem statement, creating, 116–117
procedural action, 338
process dialog box, 518–521
product. *See also* considerate product; digital product; smart product
 conflating *what* and *how* questions
 about, 114–115
 designing, 77
 posture of, 162–163
 successful, 96–97
 thinking of as computer, 183
 viability of, 70
product audit, 57
product definition, 18
product vision, 53
productivity. *See also* efficiency
 data entry and, 370
 flow and, 201–202

programmer
 alert dialog boxes and, 540
 buck-passing code and, 542
 collaboration with, 566
progress meter, 519
property dialog box, 516–517, 523
prototype, developing, 140, 142
provisional persona, 86–88
Pruitt, John (author), 81–82
pure excise, 226
purposeful interaction design, 153

Q

qualitative data, inferring goals from,
 88–89
qualitative research. *See also* ethnographic interview
 customer interview, 55
 literature review, 57
 market research and, 70
 product and competitive audits, 57
 quantitative research compared to, 50
 stakeholder interviews, 52–54
 subject matter expert interviews, 54–55
 types of, 52–57
 user interview, 56
 user observation, 56–57
 value of, 50–52, 68–69
quantifiable data, showing, 317
quantitative information, contextualizing,
 210–213
quantitative market research, 17
quantitative research, 50
querying database, 334
questions
 avoiding, 217–219, 256
 conflating *what* and *how*, 114–115
 for ethnographic interview, 65–66, 68

R

- radio butcon, 446–447
- radio button, 446–447
- ranges of user behavior, 83
- ratios for grid system, 298
- Razr phone (Motorola), 205
- reading text, 310
- Reaktor (Native Instruments), 461
- record in database, 331
- Recycle Bin, 541, 544
- Redo function, 341–342
- Reeves, Byron (*The Media Equation*), 218, 249, 250
- refinement phase of goal-directed design, 23, 141–142
- reflective level of processing, 89, 91
- Reimann, Robert (designer), 97, 115, 151
- remembering
 - choice, 263–264
 - deduced information, 265
 - foreign application activity, 266
 - pattern, 264
- remote control, 196, 197
- renaming file, 354, 359
- replacement action, 395
- reporting, avoiding unnecessary, 214–215
- repositioning object, 411–413
- represented model
 - description of, 29–32
 - mechanical-age, 35–40
 - persona expectations and, 118–119
- requirements definition phase of goal-directed design
 - brainstorming, 117–118
 - context scenario, constructing, 119–122
 - description of, 21–22, 114–115
 - persona expectations, identifying, 118–119
 - personas, scenarios, and, 115
 - problem and vision statements, creating, 116–117
 - requirements, identifying, 122–123
 - steps of, 116
- research. *See also* qualitative research;
research methodology
 - personas and, 80–81
 - quantitative, 50
 - translating into design, 19
 - user, 17, 18, 143
- research methodology
 - card sorting, 72
 - focus group, 69
 - market demographics and market segments, 69–70
 - task analysis, 72–73
 - usability testing, 70–71
- research phase of goal-directed design, 20–21
- research-design gap, bridging
 - activities for, 109
 - overview of, 18–19
 - requirements, 114–115
 - requirements definition, 115–123
 - scenarios, 110–113
- researcher, designer as, 18–19
- resizing or reshaping object, 413–415
- resolution of display surface, 313
- response time, perception of, 221
- responsiveness, optimizing for, 220–221
- restored window, 436
- retrieval system, 324
- reusing persona, 82
- reversible, making all actions, 543
- reversing changes in document, 361
- Revert command, 347
- revision, 126
- Rheinfrank, John (author), 110
- ribbon, 487–488, 502

- rich input and sovereign interface, 167–168
- rich visual modeless feedback, 545–547
- right mouse button, 381
- RIM, BlackBerry, 188
- risk exposure, degree of, 247
- role, in business and consumer domains, 61
- rollover facility, 497
- Rombaur, Irma (*The Joy of Cooking*), 560
- Rosenfeld, Louis (*Information Architecture*), 175
- rotation, 420
- rough prototype, developing, 140
- rubber-banding, 420
- Rubenking, Neil, on Undo function, 341
- rules, bending, 257–259

- S**
- Sano, Darrell (*Designing Visual Interfaces*), 205, 288
- sans-serif typeface, 310, 313
- SAP R3 ERP system, 438
- satellite device, 190
- saturated color, 311
- Save As dialog box, 353–355
- Save Changes dialog box (Microsoft Word), 350–351
- saving
 - automatically, 358–359
 - changes to file, 350–351
 - documents, and Undo feature, 337–338
- scenario
 - description of, 110–111
 - in design, 111–112
 - types of, 112–113
 - use cases compared to, 113
 - using personas in, 112
- scheduling ethnographic interview, 64
- Schön, Donald (designer), 52
- scope, limiting, of embedded system, 186
- screen archetype, applying chosen visual style to, 139
- screen real estate, 165–166
- screen rendering, 142
- screens, navigation among, 233
- scroll wheel, 381
- scrollbar, 379, 383, 469–471
- scrolling
 - auto-scrolling, 402–404
 - fine scrolling, 406–408
 - horizontal, 454–455
 - minimizing, 236, 238
- SDI (single document interface), 437–438
- secondary persona, 105
- selection. *See also* selection controls
 - command ordering and, 390–392
 - discrete and contiguous, 392–394
 - insertion and replacement, 395–396
 - visual indication of, 396–397
- selection controls
 - check boxes, 443–445, 451
 - combo boxes, 455–456
 - combutcons, 447–448
 - description of, 439, 443
 - dragging and dropping from lists, 452–453
 - earmarking, 450–452
 - entering data into lists, 455
 - flip-flop buttons, 445
 - horizontal scrolling, 454–455
 - list controls, 449–450
 - ordering lists, 453–454
 - radio buttons, 446–447
 - tree type, 457
- self-confidence of considerate product, 256
- self-referential design, 80
- The Semiology of Graphics* (Bertin), 291
- sentient, reaction to software as, 249
- sequence model, 106–107

- sequential hierarchical menu, 474–476
- serif typeface, 310, 313
- served persona, 84, 106
- Settings menu, 484
- shadow, 416–417
- shape
 - modal tool and, 409
 - visual interface design and, 291
- Shneiderman, Ben (designer), 375
- Shortcuts feature, 554
- shortcuts option for online help, 561
- show and tell in ethnographic interview, 67–68
- showing
 - causality, 314
 - change over time, 316
 - design to stakeholder, 138
 - multiple variables, 314–315
 - quantifiable data, 317
- sidebar, 514–516
- signpost, providing, 238–240
- simplicity
 - of transient application, 170–172
 - of visual interface design, 308–309
- single document interface (SDI), 437–438
- single Undo, 339, 340
- size
 - of design team, 59
 - of object, 413–415
 - of type, 310
 - visual interface design and, 291
- sketching interaction framework, 131–133
- slider, 460–461
- smart desktop phone, 184
- Smart Guides (OmniGraffle), 413
- smart product
 - idle cycle, putting to work, 260–261
 - memory and, 261–263, 265–268
 - task coherence and, 263–264
- SME (subject matter expert) interview, 54–55
- Smith, Gillian Crampton (designer), 20
- Snyder, Carolyn (*Paper Prototyping*), 126, 144–145
- soft-keyboard input, 194
- software
 - desktop, designing, 163–168
 - experience levels and, 44–45
 - implementation model and, 32–35
 - integrating design of with hardware design, 183–184
 - interacting with, 202
 - mechanical-age represented model and, 36–37
 - navigation through, levels of, 232
 - reaction to as sentient, 249
 - transparency of, 202–203
 - as treating people like machines, 530
- software development process,
 - evolution of, 6
- Software for Use* (Constantine), 43
- Sources of Power* (Klein), 89
- sovereign posture
 - description of, 164–165
 - document-centric applications and, 168
 - excise and, 226–227
 - handheld devices and, 191
 - informational Web sites and, 176
 - input and, 167–168
 - intermediate users and, 165
 - kiosks and, 194–195
 - maximized state and, 437
 - screen real estate and, 165–166
 - symmetry and, 300–301
 - visual feedback and, 166–167
 - visual style and, 166
 - Web applications and, 179–180
- spatial grouping, 295
- spatial zoom, 237

spinner, 459–460

splitter

- adjacent panes and, 233, 234, 428
- movable, 471–472

Spotlight search capability (Mac OS X), 261, 328–329

squint test, 296

St. Exupéry, Antoine de (author), 154, 309

stacked tabs, 525

staked panes, 430

stakeholder, 63, 64, 138

stakeholder interview, 52–54

standalone device, 190

standard menus, 481–484

standards

- across applications, 319–320
- benefits of, 317
- as guidelines or rules of thumb, 318–319
- risks of, 318
- violating, 319

state-indicating toolbar control, 499

static object hinting, 387

status, communicating, 213–214, 363

status area (Windows XP), 173

stereotype, 82–83

stopping proceedings with idiocy, 228–231, 530

storage

- in digital world, 326–330
- of electronic mail, 331–333
- by location, 324–325

storage system, 247–248, 324

storyboard, 110, 126, 134

storytelling, 67, 110

structural pattern, 158–159

structure of visual elements, 296–301

stupid, making user feel, 97, 370–371, 531

style, integrating function and, 306–307

style guide, 138

subject matter expert (SME) interview, 54–55

submit button, 252

summative evaluation, 144

supplemental persona, 105

suspense, state of, 258

symbol, associating to object, 303

symmetry and visual balance, 300–301

system modal dialog box, 509

system-oriented questions for ethnographic interview, 66

T

tabbed dialog box, 523–526

tabbed pane, 233–235, 430

Tabor, Philip (designer), 20

tag, 329

task, user goal compared to, 14–16

task analysis, 72–73

task coherence, 263–264, 268

task pane, 514–515

taskbar (Windows XP), 173

team

- collaboration with, 567
- design, size of, 59
- for ethnographic interview, 64, 68

technical expertise, 62

technical goals, 96

technical requirement, 123

television-based interface, designing for, 195–197

template, 559–560

terminating command, 508, 511

Tesler, Larry (researcher), 425

text

- on toolbar, 495–496
- in visual interface, 310–311, 315

text controls, 468–469

text edit controls

- clue boxes, 465–466
- handling out of bounds data, 466
- insert and overtype entry modes, 467

- units and measurements, 466–467
 - using for output, 468
 - validation, 463–465
 - texture and visual interface design, 292
 - 37signals, Writeboard, 347
 - 3D object manipulation, 415–420
 - thumbwheel, 462
 - Tidwell, Jenifer (*Designing Interfaces*), 157
 - tiling windows, 427
 - The Timeless Way of Building* (Alexander), 156
 - title of dialog box, 508
 - toggle, 444
 - tool selection and manipulation, 207–208
 - toolbar controls, 496–499
 - toolbars
 - balloon help, 497
 - butcons and, 441–442
 - choice and, 217–219
 - contextual, 503
 - customizable, 501–502
 - description of, 493–494
 - direct manipulation and, 479
 - docking, 500, 513
 - evolution of, 499–503
 - explaining controls on, 496–498
 - icons versus text on, 495–496
 - menus and, 494–495, 499–500
 - as modeless idiom, 513
 - movable, 500–501
 - navigation and, 240
 - ribbon, 487–488, 502
 - tools, navigation between, 235–236
 - Tools menu, 485
 - ToolTips, 47, 466, 497–498
 - top-level window, 436
 - touch screen, 188, 193–194
 - transactional kiosk, 191–192, 193, 195
 - transactional Web site, 177–178
 - transient posture
 - appliances and, 198
 - description of, 169–172
 - excise and, 226
 - handheld devices and, 190–191
 - informational Web site and, 176
 - kiosks and, 194–195
 - Web application and, 180–181
 - transitory bulletin dialog box, 522–523
 - transparency, 202–203
 - tree controls, 457
 - Tufte, Edward
 - on quantitative presentation, 211
 - The Visual Display of Quantitative Information*, 290, 313
 - type size, 310
- ## U
- unbounded entry control, 458–459.
 - See also* text edit controls
 - Undo cache, 257
 - Undo feature
 - blind and explanatory, 339
 - category-specific, 344–345
 - comparison model, 343–344
 - deleted data buffer and, 346
 - designing, 337–338
 - as enabling exploration, 336–337
 - file system and, 352
 - freezing, 348
 - group multiple, 342–343
 - incremental and procedural actions, 338
 - manifest model of, 341, 343
 - multisession, 265–266
 - Redo feature and, 341–342
 - single and multiple, 339–341
 - unified file model and, 361
 - users and, 335–336
 - versioning and reversion, 346–347

- Undo-proof operation, 348
- unified file model
 - abandoning changes, 361
 - communicating status, 363
 - creating copy, 359
 - creating version, 361
- File menu, changing name and contents
 - of, 362–363
 - naming and renaming, 359
 - overview of, 357–358
 - placing and moving, 360
 - reversing changes, 361
 - saving automatically, 358–359
 - specifying stored format, 360–361
- Universal Principles of Design* (Lidwell, Holden, and Butler), 307
- usability and grid system, 299
- Usability Engineering* (Nielsen), 71, 144
- usability testing
 - description of, 70–71
 - design validation and, 142–143
 - designer involvement in, 145–146
 - formative, conducting, 144–145
 - in framework phase, 126
 - summative and formative evaluations, 144
- use case, persona-based scenario
 - compared to, 113
- useit.com Web site, 175
- user. *See also* beginner; expert user; intermediate user; user goals; user interface
 - as elastic, 79–80
 - ethnographic interview and, 67
 - making feel stupid, 97, 370–371, 531
 - perception of, by stakeholders, 54
 - predicting actions of, 261–263, 268
- user archetype, 21
- user experience, 140, 177–178
- user feedback session, 142–143
- user goals
 - creation of digital products and, 4–5
 - designing to meet, in context, 16–17
 - development process and, 9–10
 - end type, 93
 - experience type, 92–93
 - ignorance about, 8–9
 - life type, 93–94
 - product success and, 25–26
 - recognizing, 13–14
 - successful products and, 96–97
 - tasks and activities compared to, 14–16
 - types of, 92–94
 - as user motivations, 94
- user interaction and mechanical-age
 - represented model, 36–37
- user interface. *See also* metaphor in user interface; visual interface design
 - as artifact, 202
 - attractiveness of, 90
 - branding, customer experience, and, 306–307
 - excise in, 224–225
 - experience levels and, 41–44
 - graphic design and, 289
 - implementation model and, 32–33
 - inflecting, 245–247
 - invention of, 279
 - mathematical thinking and, 34–35
 - mental models and, 31
 - paradigms in design of, 270–276
 - well-balanced, 43–44
- user interview, 56
- user observation, 56–57
- user profile, 85–86
- user research, 17, 18, 143. *See also* qualitative research; research methodology
- user role, 84–85

V

- validation controls, 463–465
- validation scenario
 - checking designs with, 135–136
 - description of, 113
 - refinement phase and, 23
- value and visual interface design, 291
- Vander Wal, Thomas (information architect), 329
- variables, 61–62, 98–99, 314–315
- Veen, Jeffrey (*The Art and Science of Web Design*), 175
- verbal thinker, 135
- verb-object ordering, 390–392
- vernier mode, 407–408
- versioning, 346–347, 361
- vertex handle, 414–415
- vertical axial symmetry, 300
- View menu, 484
- views, 233, 238
- violating standards, 319
- virtual desktop, 427–428
- visceral level of processing, 89–90
- visible hierarchical menu, 476–477
- vision statement, creating, 116–117
- Visual Basic, 436
- visual design framework
 - defining, 136–139
 - description of, 126
 - television-based interfaces, 195
- visual dislocation, hiding commands for, 220
- The Visual Display of Quantitative Information* (Tuft), 290, 313
- visual excise, 226–227
- visual feedback
 - direct manipulation and, 386
 - drag-and-drop operation, 399, 401–402
 - selection state, 396
 - sovereign interface and, 166–167
- visual framework/visual language
 - strategy, 23
- visual idiom, 276
- visual information design. *See also* visual interface design
 - causality, showing, 314
 - changes over time, showing, 316
 - content, ensuring, 315–316
 - enforcing visual comparisons, 314
 - multiple variables, showing, 314–315
 - overview of, 289–290
 - principles of, 313–314
 - quantifiable data, showing, 317
 - text, graphics, and data, integrating, 315
- visual interface design. *See also* visual information design
 - art, other design disciplines, and, 288
 - building blocks of, 290–291
 - color in, 311–312
 - grouping elements and providing hierarchy, 294–296
 - for handhelds and other devices, 312–313
 - hue and, 292
 - imagery, using, 302–305
 - noise and clutter, avoiding, 307–308
 - orientation and, 292
 - overview of, 287
 - position and, 293
 - principles of, 293
 - shape and, 291
 - simplicity and, 308–309
 - size and, 291
 - structure and flow, providing, 296–301
 - style and function, integrating, 306–307
 - text and, 310–311
 - texture and, 292
 - value and, 291
- visual language study, developing, 136–139
- visual metaphor, 425
- visual noise, avoiding, 307–308

visual style and sovereign interface, 166
 visual thinker, 135
 visual work, minimizing, 151
 visualizing
 behavior, 304–305
 interface, 131–133
 vocabulary, interaction, 280–281

W

wait cursor hinting, 390
 Web, designing for, 174–175
 Web application, 178–181
 Web site, 175–178
 whiteboard, 133
 windows
 Alto system, 423–424
 command-line interface compared to,
 224–225
 designing with, 430–436
 full-screen applications, 427–428
 keeping to minimum, 238
 management of, 233
 MDI versus SDI, 437–438
 multipaned application, 428–430
 overlapping, 426–427
 PARC principles, 425–427
 pluralized, 190, 436–437
 pop-up, 190
 position of, 264
 states, 436–437
 tiles, 427

Windows (Microsoft). *See also* Microsoft
 Outlook; Microsoft PowerPoint;
 Microsoft Word
 auto-scrolling, 403
 Confirm File Delete dialog box, 541
 Disk Properties dialog box, 317
 Explorer, 212–213, 394
 File Manager, 211, 212–213
 first version of, 427
 user interface, 33
 Vista, icons, 304
 XP taskbar, 173
 Windows menu, 483
 windows pollution, 434–436
 wire frame, 418
 wizard, 561–562
 WordStar, 165
 workflow model, 106–107
 workflow-oriented questions for
 ethnographic interview, 66
 working set, 552–553
 world, information in, 553
 world vector, 553–554
 Writeboard (37signals), 347
 WriteRoom (Hog Bay Software), 206

X

Xerox Palo Alto Research Center (PARC),
 279, 423–427

Y

Yahoo! Widgets and iTunes, 170

Z

zoom, 420
 zooming, 236, 237