

Index

- A-box, 354
Adaptation, content, 403–404, 408, 411, 425–426. *See also* Annotation
Adapter, UPML, 147–148, 153
Addressing expression, 421–423
Advertising, 370
Aerospace customer service, 230–233
FISRs, 232, 239–241
HD requests, 231–233, 241–242
Agent, Web, 382–383, 385
Administrator, 19, 23, 197
AIFB Web site, 318
Air Campaign Planning Process Panel (ACP³), 258, 432, 439, 448–449
Alternate perspective, 43
Annotation, 403–424
addressing, 421–423
classes, 75–76
content adaptation, 403–404, 408, 411, 425–426
descriptions, 406
external, 404–408
Glue, 394
Knowledge Annotator, 52–53, 55
page splitting, 404, 411–421
repository, 408
RHKBs, 272–274
tools, 17–18
transcoding, 403–404, 408–411, 424–425
transformation engine, 424
Antecedent, 39
Anticipatability, 226–227
Architecture, Web, 172–173
Ariadne, 145
ARP (Another RD Parser), 214
Artificial intelligence (AI), 33, 378, 381
Ask Jeeves, 228–230
Associate resource, 286
Atomic datatype, 105–106
Attribute, 32, 106, 365
binding patterns, 289–290
DAML-ONT, 72–73
domain modeling, 284–285
resource, 72, 75, 288–289
type, 112
UPML, 152
Authoring-time transcoding, 409–411
Automated planning, 258, 439
Automatic configuration, 363
Automatic document generation, 4

- Automatic text recognition, 6
- Axiom, 324, 325
- Axiomatic semantics, 68
- DAML-ONT, 79–89
- OIL, 102–103, 119, 132–133
- RDF/S, 82, 119
- UPML, 150
- Backward compatibility, 48–50, 66
- OIL and RDF Schema, 134–135
- Base ontology, 327, 365
- Basetype, 106
- Batch processing view, 385, 387
- Battlespace Challenge Problem, 255
- Berners-Lee, Tim, 29, 172
- Binary relation, 132, 324
 - UPML, 148, 157
- Binding pattern, 289–290
- Bluetooth, 372
- Boeing Thesaurus, 235, 237
- Bookmark, semantic, 345–346
- Boolean class expression, 119
- Boolean query, 385
- Bridge relation, 148, 153–154
- Brokering service, 142–146, 164–165
- Browsing, 18–19
 - dynamic semantics, 381–382
 - taxonomies, 180
 - Web agents, 385
- Built-in datatype, 106
- Caching, data, 209
- Capability description, 363–364
- Capability record, 311–312
- Cardinality
 - DAML-ONT, 71, 75
 - OIL, 119, 129
- Catalog, 175
- Categorization hierarchy, 33
- Category claim, 41
- Category definition, 37
- CGI script, 380
- Check-box personalization, 344–345
- Child element, 110
- Chimaera, 16, 182, 188, 190
- Clarke’s Urban Growth Model, 295–296, 299
- Class
 - annotation, 75–76
 - DAML-ONT, 69–73, 85–86
 - defined/primitive, 100, 128
 - Glue, 392
 - is-a-instance-of link, 33
 - RDFS, 117, 128
 - UPML, 148
- Class definition, 100, 112, 119, 124
- OIL vs. RDF Schema, 127–128
 - as query, 182
- Class expression, 100–101, 119
 - OIL, 129–130
 - RDF Schema, 200–201
 - CLASSIC, 33, 67
 - COA comparison matrix, 442, 445, 449
 - Comment, DAML-ONT, 70
 - Common Lisp, 444
 - Comparative search, 184
 - Competence concept, 151
 - ComplementOf tag, 76
 - ComplexType definition, 122–124
 - Complex relationship, 279. *See also*
 - Information integration system
 - Composed element, 110
 - Composite Capability Preference Profile (CC/PP), 363, 365, 407
 - Concept, 17, 324
 - Concept-based search, 224, 242
 - Conceptual Knowledge Markup Language (CKML), 57
 - Conceptual Modeling Language (CML), 143
 - Concrete type, 101, 119
 - Configuration support, 183

- Conjunctive semantics, 130
- Consequent, 39
- Consistency, 181, 214, 255
 - multiagent systems, 264
 - plan generation, 257–258
- Constraining facet, 105
- Constraint, 117–118, 297–298, 301
 - cross-constraints, 435–437
 - plan representation, 433–438
- Constraint satisfaction problem (CSP), 436–437
- Constructor, 67–68
- Content adaptation, 403–404, 408, 411, 425–426. *See also* Annotation
- Content transcoding, 403
- Controlled vocabulary, 175, 179, 182, 185–186
- Copy down semantics, 392–393
- Core Plan Representation (CPR), 433
- Corporum, 23
- Cotopy, 340–341, 343
- Course of Action (COA), 257, 439–441
 - COA comparison matrix, 442, 445, 449
- Crawler, 53, 332, 348–350
- Customized search, 184
- CYC, 11
- Cyc-L, 33, 177

- DARPA Agent Markup Language-Ontology (DAML-ONT), 9–11, 65–91, 186–188
 - axiomatic semantics, 68, 79–89
 - classes, 69–73, 85–86
 - comments and labels, 70
 - DAML+OIL, 69, 79, 188, 219–220, 279
 - development, 67–68
 - expressive extensions, 78–79
 - individuals, 70–72
 - namespaces, 77–78
 - properties, 71–77, 87–89
 - RDF/S, 66, 77–78, 80, 364–365
 - Web site, 68–69

- DARPA High Performance Knowledge Base (HPKB), 255
- Data
 - caching, 209
 - exchange, 7
 - metadata, 9, 243–244, 364–365, 404
 - mining, 352–353
 - postprocessing, 281–282, 295
 - RDF, 349–350
 - schema, 209
 - set, 182–183
 - stream, 208, 213
 - transparency, 380–381
 - Web, 281, 289
- Data characteristic (DC) rule, 290–291
- Database, 384
 - deductive, 35
 - extensional/intensional, 35
 - relational, 54, 210, 335
 - schema, 97
 - semistructured, 57–58
- Database management system (DBMS), 206–207
 - ORDBMS, 210–212, 214
 - RDBMS, 54, 210, 220, 296
- Datalog, 35, 50–51
- Datatype, 104–106, 110, 119, 124
- Debugging, 388–389, 391
- Declarative semantics, 377, 390
- Deductive database, 35
- Defined type, 100, 128
- Description language, 164
- Description logic (DL), 17, 66–67, 188, 323
- Device coalition, 364, 371
- Disambiguation, 180–181, 229
- Discourse analysis, 271
- DisjointFrom relation, 70
- DisjointUnionOf element, 76
- Disjunctive semantics, 130
- Distributed workforce, 189
- DMOZ (Directory Mozilla), 178–179

- Document
 - valid/well-formed, 32
 - XML, 103–104, 125, 136
- Document Object Model (DOM), 36
- Document tree, 422–423
- Document type definition (DTD), 32, 103–104, 156
- Domain
 - functional dependencies, 286–287
 - information requests, 281
 - integrated/source views, 282–283
 - modeling, 283–285, 322–323, 329–330
 - queries, 280
 - restrictions, 72, 118, 130–131
 - rules, 285–286
 - search, 229–230
- Domain Model concept, 151
- Dreamweaver, 379
- Dublin Core, 152, 351
- Dummy type, 111
- Dynamic knowledge, 142, 145, 163
- Dynamic semantics, 377–391. *See also* Glue
 - browsing, 381–382
 - procedural semantics, 381, 387–391
 - and static semantics, 380–381
 - theory-proving paradigm, 385–387
- Web agents, 382–383, 385
- Web editing, 382
- Earthquake ontologies, 299–302
- Easyminer, 352–353
- ECYC, 181
- EDIFACT, 6–7
- Editor, 12–15, 188–189
 - annotation, 410–411, 414
 - Knowledge Annotator, 52–53
 - plan generation, 258, 260
 - Protégé, 13–14, 157–163, 188
 - text, 52
 - Web, 379, 382
- EI2 (Extended Information Item), 274–276
- Electronic commerce, 2
- B2B, 6–8, 19–23
- B2C, 5–6, 23
- Element, 32, 106
 - declaration, 107
 - definition, 124
 - reference, 107
 - signature, 150
 - types of, 109–110
- Encoded test suite, 183
- End-tag, 32
- Entity class, 148
- Entity relationship (ER) model, 112–114, 121
- equivalentTo tag, 74
- Erdoes number, 350
- Execution locus, 370
- EXPECT, 254, 256, 257, 261, 272
- Expectation setting, 179
- Exposé, 53–56
- Extensibility, 179–180, 191, 267
 - annotation, 411
 - complex type, 107
 - knowledge bases, 323
 - RHKB, 270
 - SHOE, 39, 44–45
- Extension, language
 - DAML-ONT, 78–79
 - RDF, 120
- Extensional database (EDB), 35
- External annotation, 404–408
- Extracting information, 4, 382
- Facet, 104–105
- FaCT, 17, 122
- Field, Glue, 394–395, 398
- FindUR, 180
- First-order predicate calculus, 79–80
- Fleet issues summary report (FISR), 232, 239–241
- F-logic KB, 238

- Focused crawler, 53, 349
- Formalization phase, 119, 327, 330
- Frame Logic (F-logic), 57, 234, 236–238, 321, 330
- Frame system, 33, 66, 187, 365
- Frequency, query, 227–228
- Function Store, 296
- Functional dependency (FD), 286–287
- Functionality description, 368–369
- Fundamental facet, 105
- Generalization hierarchy, 176, 179
- Generated datatype, 106, 107
- Generator, 414–416
- Global variable, 243–244, 247
- Glossary, 175
- Glue, 378, 389–390. *See also* Dynamic semantics
 - dynamic lookup, 392–393
 - features, 392–395
 - and Java, 397–399
 - and Javascript, 399–400
 - methods and objects, 393–394, 398
 - procedural markup, 390–391
 - syntax, 395–398, 400
 - target audience, 392
- Goal-driven assembly, 371
- GoLive, 379
- Google, 171
- Graphical editor, 159–161
- GSM (Global System for Mobile Communications), 455
- Hash table, 398
- Has-subtopic, 329
- Help desk (HD) request, 231–233, 241–242
- Hierarchy
 - categorization, 33
 - concept, 17
 - generalization, 176, 179
- OIL and RDF Schema, 133–134
- OIL and XML Schema, 122
- subclass, 176–177
- term, 176, 179
- UPML classes, 148–149, 159–160
- Horn clause, 35, 43–44
- Hotbot, 181
- HTML, 8–9, 31–32, 141, 171
 - annotations, 403–404
 - electronic commerce, 7
 - and Glue, 391
 - keywords, 394
 - page splitting, 404, 411–421
 - procedural semantics, 389
 - search questions, 229
 - template engine, 235–236, 244
 - XHTML, 9
- Human Computer Interaction (HCI), 381
- Hyperbolic browsing interface, 19
- Hyperlink, 335, 347
- IBROW project, 142–145, 164–165
- ICS-FORTH, 214
- Import element, 109
- $\langle I\text{-}N\text{-}CA \rangle$, 432–438
- Include element, 108–109
- Index, 289
- Inference engine, 17, 187, 214–215, 334.
 - See also* Reasoning service
- Inference rule, 39, 47
- InfoQuilt
 - applications, 298–302
 - features, 280–282
 - Function Store, 296
 - information sources, 288
 - IScape Builder, 305
 - IScape Processing Monitor, 308–310
 - IScapes, 280–281, 296–301
 - Knowledge Builder, 283, 293, 303–305
 - operations, 294–296
 - and related systems, 310–312

- InfoQuilt (cont.)
 - simulations, 295
 - source-centric approach, 282–283
 - Web-accessible interface, 305–308
- Information access, 18–19
- Information extraction, 4, 382
- Information integration system, 279–313
 - domain modeling, 283–287
 - information requests, 280–281, 296
 - interontological relationships, 293–294, 298
 - query-centric approach, 282–283
 - resources, 288–292
 - source-centric approach, 282–283
- Information Manifold (IM), 310–312
- Information retrieval (IR) model, 384
- Information Scape (IScape), 280–281, 296–301
- InfoSleuth, 310
- Inheritance
- Glue, 398
- OIL vs. RDF Schema, 118
- OIL vs. XML Schema, 111–112, 126–127
- Inline annotation, 405
 - $\langle I\text{-}N\text{-}OVA \rangle$, 432–438
- INSPECT, 258–260
- Instance, 36, 176, 325
 - F-logic, 237
 - Glue, 392–393, 398–399
 - SHOE, 40–41, 46
- Instance-of link, 33
- Instantiation
 - global variables, 243–244, 247
 - knowledge bases, 325
 - templates, 235, 246
- Integration. *See* Information integration system; Knowledge base
- Intended perspective, 43
- Intensional class definition, 119, 323
- Intensional database (IDB), 35
- Intensional type definition, 110
- Interconnectivity, 189
- Intermediary, 408–409
- Internet, 7. *See also* World Wide Web
- Internet Explorer 5.0, 236
- Interontological relationship, 293–294, 298
- Interoperability, 182, 253, 265
 - LARKS, 164–165
 - multiagent systems, 264
 - RHKB, 270
 - semantic gadgets, 370
 - SHOE, 44–47
- InverseOf tag, 75
- Is-a link, 33, 111, 176–177, 329, 354–355
- IScape, 280–281, 296–301
- IScape Builder (IB), 305
- IScape Processing Monitor (IPM), 308–310
- I-X project, 436
- Java, 388, 397–399
- Javascript, 388, 399–400
- Jini, 363–364
- Join operation, 213
- KEE, 66
- Key, URL as, 46
- Keyword-based search, 4, 18, 57, 281, 394
- KIF (Knowledge Interchange Format), 67, 81, 187, 261
- KL-ONE, 33, 67
- Knowledge Annotator, 52–53, 55
- Knowledge base, 53, 253–277
 - defined, 324–325
 - development, 266–267
 - extensibility/reusability, 267, 270
 - HPKB, 255
 - and languages, 265
 - mapping/translation, 254–255, 261–264, 270
 - modifying, 303–305
 - multiagent systems, 262–264

- and ontologies, 318–327, 330, 353–354
- plan generation, 255–262
- QKB, 338–344
- rationale trail, 271
- representational mismatch, 257, 260, 262–263
- RHKB, 268–276, 269
- semantic ranking, 338–344
- theory-proving paradigm, 386
- Web, 253–254, 271–272
- Knowledge-based system (KBS), 142–143
- Knowledge Builder (KB), 283, 293, 303–305
- Knowledge Component concept, 150
- Knowledge management, 4–5, 22–23
- Knowledge portal, 351–352. *See also* SEAL (SEmantic portal)
- Knowledge representation (KR), 33–34, 364
- Knowledge Representation System Specification (KRSS), 187
- Knowledge Warehouse, 334–335
- KQML message, 448
- KRL, 33
- KRSL plan representation language, 432–433
- Label, DAML-ONT, 70
- Language. *See also* Ontology
 - description, 164
 - extension, 78–79, 120
 - knowledge representation, 265
 - mapping, 255, 262–262
 - markup, 172, 391
 - multilanguage environments, 388–389
 - natural, 14
 - ontology, 7–11, 186–188
 - query, 57–58, 197–198, 201–205
- LARKS (Language for Advertisement and Request for Knowledge Sharing), 164–165
- Letizia, 382–383, 385
- Lexical space, 104–105
- Lexicon, 324–327, 338
- Library concept, 149
- Life cycle, 190
- $\langle \text{link} \rangle$ tag, 408
- Lisp, 381
- List datatype, 105–106
- Literal datatype, 119
- Local completeness (LC) rule, 291–292
- Local property restriction, 118
- Location services (LCS), 455
- Log file, 345–347
- Logic constraint, 177
- Logic layer, 173
- LOOM, 33, 67, 256, 261, 310–311
- Lycos, 181
- Magic set, 35
- Maintenance, information, 2, 4
- Mapping, 255, 261–265, 295
- Markup language, 172, 391. *See also* Language
- Math-Net project, 351
- Meaning triangle, 319
- Mediator, 58, 310
- Mediator Specification Language (MSL), 311
- Membership function, 325
- MESMUSES, 204
- Metacrawler, 145
- Metadata, 9, 243–244, 364–365, 404
- Metaknowledge, 151–152
- Metasearch, 224, 242
- Methontology framework, 326
- Military planning, 432–433
- Mixed element, 110
- Mixed-initiative plan generation, 258–260, 439, 441–442
- Mobile ADK, 454
- Mobile device, 449–455
- Modeling primitive
- OIL vs. RDF Schema, 118–119
- OIL vs. XML Schema, 109–110, 112
- RDF and RDF Schema, 115–118, 217–218

- Modeling, domain, 283–285, 322–323,
 329–330
 Monitor, 414
 Multiagent system, 262–264, 432, 439, 442
 Multilanguage environment, 388–389
 Multiple inheritance, 111, 126–127
 Multiple keys, 46
 Museum scenario, 365–368, 371–374
- Namespace
 DAML-ONT, 77–78
 XML Schema, 107–109
 National Institute of Standards and
 Technology (NIST), 185
 Natural language, 14
 Navigation, 18–19, 179, 381–382
 Negation, stratified, 35
 Net, semantic, 378
 News page, 416–423
 NIST Process Specification Language (PSL),
 433
 Noncombative Evacuation Operations
 (NEO), 444
 Nonfundamental facet, 105
 Nuclear testing ontologies, 299–302
- Object match (OM), 341
 Object-attribute-value triple, 198, 202–204,
 234
 Object-relational database management
 system (ORDBMS), 210–212
 OBSERVER, 310–311
 OCML (Operational Conceptual Modeling
 Language), 159
 OilEd, 188
 OKBC (Open Knowledge Base Connec-
 tivity), 67
 tag, 403
 Online store, 5–6
 Ontobroker, 17, 22, 57, 145
 RDFMaker, 348
- SEAL, 317, 332, 334
 and SHOE, 351–352
 OntoEdit, 216, 330
 OntoExtract, 216
 On-To-Knowledge, 22–23, 197, 216
 Ontolingua, 66, 177, 188–189
 Ontology, 7, 36, 95, 171–191. *See also*
 Extensibility
 acquisition, 185–186
 base, 327, 365
 defined, 11, 33–34, 173–174, 319, 322–
 324
 domain modeling, 283–285, 322–323,
 329–330
 editors, 12–15
 environments, 15–16
 evolution, 47–50
 information access, 18–19
 integration, 50, 264
 interontological relationships, 293–294,
 298
 and knowledge bases, 318–325, 327, 330,
 353–354
 languages, 186–188
 layer, 172–173
 logics, 320–321
 maintenance and support, 188–191
 plan representation, 431–432
 properties, 178–179
 PSMs, 143
 and schemas, 96–98, 113–114
 SHOE, 37–40, 44–50
 simple, 178–181
 spectrum of, 174–178
 static/dynamic knowledge, 142, 145
 structured, 181–185
 target, 326–328
 umbrella, 179–180
 UPML, 150
 well-formed, 43
 Ontology engineering, 325–331

- baseline/seed ontology, 327
evaluation and maintenance, 328, 330–331, 347
ontology requirements specification document (ORSD), 326
target ontology, 326–328
Ontology Inference Layer (OIL), 9–10, 57, 67, 98–103
axioms, 102–103, 119, 132–133
class definitions/expressions, 100–101, 127–130
concrete-type expressions, 101
DAML+OIL, 69, 79, 188
modeling primitives, 118–119
ontology containers/definitions, 100
and RDF Schema, 118–121, 127–136
slot constraints/definitions, 100–102
and UPML, 163
Web site, 69
and XML Schema, 109–114, 121–124, 135–136
Ontology Markup Language (OML), 57
OntoMorph rewrite engine, 262
Ontoprise, 19
Open Directory, 33
Open Knowledge Base Connectivity (OKBC), 158, 187
Open Planning Process Panels (O-P³), 432, 438–447
ACP³, 432, 439, 448–449
applications, 439
COA matrix, 442, 445
generic, 440–441
Task Assigner/Planner, 442–445
Task Formalism implementation, 438, 444, 452
WOPlan, 449–455
OQL, 204–205
< p > tag, 404
Page splitting, 404, 411–421
adaptation engine, 414–416
annotation vocabulary, 412–414
importance value, 414, 416–417
news page, 416–423
small-screen device, 418–421
Parka, 54–56
Parser, 214, 215
Partial forward compatibility, 135
Partial understanding, 365
Path expression, 205
Pattern matching, 205
Payment, 370
Perl, 388
Personalization, Web site, 318, 332–333, 344–346, 352–353
Perspective, 43–44
intended/alternate, 43
semantically subsumed, 44, 48
Plan representation, 255–262, 431–456
< I-N-OVA > and *< I-N-CA >*, 432–438
ACP³, 432, 439, 448–449
automated planning, 258, 439
COAs, 261–262, 439–441
constraints, 433–437
mixed-initiative, 258–260, 439, 441–442
O-Plan, 432, 437–447
plan modification operators, 436
planning process, 438–440
WOPlan, 449–455
Polysemy, 29
SHOE, 45–46
Portal, 351–352. *See also* SEAL (SEmantic portAL)
PostgreSQL, 211–212, 215, 218
Postprocessing, data, 281–282, 295
Powerscout, 383, 385
Pragmatics concept, 152
Predicate match (PM), 341–343
Preference-based personalization, 344–345, 352
Presentation style, 190–191

- Preset constraint, 297
- Previewer, 410
- Primitive element, 109–110
- Primitive type, 100, 106, 128
- Privacy, 369
- Problem Decomposer, 152, 161
- Problem-solving method (PSM), 142–143, 256–257
- Procedural semantics, 381, 387–391
- Process Interchange Format (PIF), 433
- Product information
 - catalogs, 19–22
 - shopbots, 6
- Projection list, 298
- Prolog, 35, 381
- Property
 - DAML-ONT, 71–77, 87–89
 - OIL, 119
 - RDF, 115, 129, 132, 157
 - RDFS, 117, 132
 - restrictions, 118, 177
 - UPML, 151–152
 - Protégé, 13–14, 157–163, 188
 - Protocol handler, 208, 215
 - Proxy, transcoding, 408–409
 - PSM concept, 152
- Query, 18–19. *See also* RQL; Search; Sesame
 - binding patterns, 289–290
 - Boolean, 385
 - class definitions as, 182
 - expansion, 180, 244
 - frequency, 227–228
 - generalization/specialization, 184
 - information requests, 280–281, 296
 - languages, 57–58, 197–198, 201–205
 - metadata/user, 243–244
 - optimization, 213–214, 290–291, 312
 - as question, 23, 229
 - RDBMS, 54–55
 - recursive, 312–313
- SEAL, 335
- semantic bookmarks, 345–346
- SQL, 220, 298, 384
- structured, 184
- task-centered approach, 225, 242–244
- template approach, 235
- theorem-proving model, 385–386
- Web pages, 172
- Query knowledge base (QKB), 338–344
- Query-centric approach, 282–283
- Question, 229
- Range restriction, 72, 74
- consistency checking, 181
- OIL, 118, 130–131
- Ranking, semantic, 318
- Rationale trail, 271
- RDF, 9–10, 95–96, 114–116, 197, 236
 - annotation files, 407–408
 - axioms, 82
 - DAML-ONT, 66, 77–78, 80, 364–365
 - files/stores, 210
 - namespaces, 77–78
 - network services, 210–211
 - properties, 115, 129, 132, 157
 - querying, 201–204
 - reification, 199, 216
 - and Sesame modules, 207–215
 - SiLRI, 234
 - statements, 115
 - syntax, 156–157
 - triples, 198, 202–204, 234
 - “type” property, 81–82
 - URIs, 365
 - XML, 34, 66, 199–202
- RDF Crawler, 332, 348–350
- RDF Ferret, 216
- RDF Generator, 332, 347–350
- RDF Schema (RDFS), 9, 34–35, 95–96, 197
 - axioms, 82, 119
 - class definitions, 127–128

- class expressions, 200–201
- DAML-ONT, 66, 80
- inconsistencies, 217–218
- modeling primitives, 116–118
- and OIL, 118–121, 127–136
- properties, 117, 132
- RQL, 204–205
- and Sesame, 208
- and UPML, 157, 161
- RDF-API, 349
- RDFMaker, 348
- Reasoning Resource, 152
- Reasoning service, 17, 67, 142–145, 187. *See also* Inference engine; Sesame
- Reconnaissance agent, 383
- Recursive query, 312–313
- Redefine mechanism, 108–109
- Reference function, 323–324
- Refiner relation, 148, 153–155
- Regression testing, 183
- Reification, 199, 216
- Relation claim, 41
- Relational database management system (RDBMS), 54, 210, 220, 296
- Relational database schema, 97
- Relational definition, 37
- Relational model, 112–114, 121
- Relationship, complex, 279. *See also* Information integration system
- Remote repository, 211
- Renaming, 39, 44–45, 155
- Repository abstraction layer (RAL), 207–211, 220
- Representational mismatch, 257, 260, 262–263
- Resilient Hyper-Knowledge Base (RHKB), 268–276
- annotations, 272–274
- contradictions, 269
- development, 272
- extensibility/reusability, 270
- Resource, 212
- associate, 286
- attributes, 72, 75, 288–289
- binding patterns, 289–290
- data characteristic rules, 290–291
- local completeness rules, 291–292
- location, 231–233
- RDF, 115
- task-centered, 238–242
- RETSINA project, 164–165
- Reusability, 34, 154, 181, 267
- ontology development, 327
- RHKB, 270
- RMI (Remote Method Invocation), 207
- RosettaNet, 185
- RQL, 201, 204–205
- reification, 216
- Sesame query module, 207, 213–214
- Run time-configurable constraint, 297–298, 301
- Running SHOE, 53, 55
- Scalability, 189
- Sesame, 218–219
- SHOE, 50–51
- Schema, 96–98, 113–114. *See also* RDF Schema; XML Schema
- Schema data, 209
- Screen size, 451
- SEAL (SEmantic portAL), 317–356
- agents and modules, 332–333
- architecture, 332–333
- bookmarks, 345–346
- Knowledge Warehouse, 334–335
- lexicon, 338
- log files, 346–347
- navigation module, 335
- Ontobroker, 332, 334
- ontology engineering, 325–331
- and other portals, 351–352
- query module, 335

- SEAL (SEmantic portAL) (cont.)
 RDF Crawler, 348–350
 RDF Generator, 347–350
 semantic personalization, 318, 332–333, 344–346, 352–353
 semantic ranking, 318, 333, 338–344, 353
 template module, 336–337
 user IDs, 346
 Search, 1–2, 171. *See also* Query
 keyword-based, 4, 18, 57, 281, 394
 metasearch, 224, 242
 questions, 229
 semantic markup, 225–226
 SHOE, 54
 tagging, 180
 theorem-proving model, 385
 types of, 184–185
 Security, 189–190, 369–370
 Self, 392
 Semantic gadget (SG), 363–375
 car SG, 366–368, 372, 374
 device coalition, 364, 371
 museum scenario, 365–368, 371–374
 security and trust, 369–370
 service discovery, 363–364, 368–371
 shopping SG, 367, 373–374
 Semantic network, 33, 312, 378
 Semantic personalization, 318, 332–333, 344–345, 352–353
 Semantic portal. *See* SEAL (SEmantic portAL)
 Semantic ranking, 318, 333, 338–344, 353–354
 Semantically Marked Information Base (SMIB), 274
 Semiautomated construction, 14–15, 382
 Semistructured database, 57–58
 Server
 plan generation, 259–260
 SEAL, 346–347
 Service discovery, 363–364, 368–371
 Sesame, 197–198, 205–221
 architecture, 206–208
 and DAML+OIL, 219–220
 HTTP, 215, 217
 memory and performance, 208–209, 219
 PostgreSQL, 211–212, 215, 218
 RAL, 207–211
 RDF admin module, 214–215, 220
 RDF export module, 215
 and RDF Schema, 217–218
 RQL query module, 207, 213–214, 216
 SGML, 31
 Shared Planning and Activity Representation (SPAR), 433
 SHIQ, 68
 SHOE (Simple HTML Ontology Language), 22, 29–59, 67
 contradictions, 46–47
 inference rules, 39, 47
 instances, 40–41, 46
 Knowledge Annotator, 52–53, 55
 and Ontobroker, 351–352
 ontologies, 37–40, 44–50
 renaming, 39, 44–45
 Running SHOE, 53, 55
 scalability, 50–51
 search, 54
 semantics, 41–44
 XML, 36
 Shopbot, 5–6
 Shopping SG, 367, 373–374
 Signature definition, 150
 Similarity, 353–354
 Simple element, 109–110
 Simple Logic-Based RDF Interpreter (SiLRI), 234, 236
 SIMS, 281, 310–311
 Simulation, 295
 Singleton, 398
 SIRPAC RDF parser, 215

- Slot definition, 100–102, 112, 122. *See also*
 Attribute
 F-logic, 237
 OIL vs. RDF Schema, 130–132
 Slot-constraint, 101
 Small-screen device, 418–421
 Smalltalk, 381
 Smith, Reid, 225
 SOAP (Simple Object Access Protocol), 207
 Source-centric approach, 282–283
 SQL query, 220, 297, 298, 384
 Standardization, 368
 Stanford API, 208
 Start-tag, 32
 State model, 440
 Static knowledge, 142, 145
 Static semantics, 377–381. *See also* Dynamic
 semantics
 Stratified negation, 35
 Streaming, data, 208, 213
 Structure, XML Schema, 106–107
 Structured search, 184
 Subclass, 176–177, 211
 SubclassOf relation, 70, 73, 200, 205, 218
 Super device, 371
 Synonymy, 29
 SHOE, 45–46

 Table, layout, 416–417
 Tag, 31–32, 155, 180
 Glue, 393
 resource, 240
 variable substitution, 246–247
 Target namespace, 107–108
 Target ontology, 326–328
 Task concept, 151
 Task-achieving agent, 431–432. *See also*
 Plan representation
 Task-centered knowledge support, 223–250
 Ask Jeeves, 228–230
 domain, 229–233
 problem-solving, 226–230
 queries, 225, 242–244
 resources, 231–233, 238–242
 semantic metadata services, 233–235
 task categories, 232–233
 template engine, 235
 Taxonomy, 33, 324
 T-box, 354–355
 Template approach, 235, 242–247
 Temporal Estimation/Assessment problem
 solver, 256
 Testing, 182–183
 Text editor, 52
 Text extraction, 271
 Text-To-Onto, 14–15
 Theorem-proving model, 384–387
 Thesaurus, 175–176, 235
 Time stamp, 309–310
 Topic map, 236
 Transcoding, 403–404, 408–411. *See also*
 Annotation
 task-specific, 424–425
 Web content, 403
 Transformation engine, 424
 Transitive Property tag, 75
 Translation, 7–8, 126–127, 253
 annotations, 425
 automated, 127
 mappings, 254–255, 261–264
 modeling styles, 255, 265
 multiagent systems, 262–264
 OIL and XML Schema, 121–124
 RHKB, 270
 syntactic, 262–263
 Transmissible spongiform encephalopathies
 (TSE) ontology, 56
 Transparency, data, 380–381
 Tree, document, 422–423
 TRELLIS, 254, 272–276
 Annotation/Creation tools, 274–275
 core markup language, 273

- TRELLIS (cont.)
 - information items, 274–276
 - SMIB, 274
- Triple, object-attribute-value, 198, 202–204, 234
- Trust, 369–370
- TSE Path Analyzer, 56
- TSIMMIS, 310–311
- Type attribute, 112
- Type checking, 42, 181
- Type definition, 100, 110
- “Type” property, 81–82
- Ubiquitous computing, 363–364. *See also* Semantic gadget (SG)
- Umbrella ontology, 179–180
- Unified medical language system (UMLS), 179
- Unified Problem-Solving Method
 - Development Language (UPML), 141–165
 - architecture, 146–148
 - axioms, 150
 - Binary Relations, 153–155
 - Concept, 149–153, 157
 - and LARKS, 164–165
 - and OIL, 163
 - Protégé -2000, 157–163
 - and RDF Schema, 157, 161
 - requirements, 145
 - reusability, 154–155
 - XML Schema, 155–156
- Uniform resource identifier (URI), 365
- UniqueProperty, 74
- Universal Plug and Play (UPnP), 363–364
- Universal Standard Products and Services
 - Classification (UNSPSC), 179–180
- Upwards cotype (UC), 340–341
- URL as key, 46
- User profile, 383
- User query, 243
- User support, 190
- User-derived datatype, 106
- Uses attribute, 154
- Valid document, 32
- Validation testing, 182
- Value chain, 371
- Value restriction, 72–73, 177, 181
- Value space, 104–105
- Variable
 - global, 243–244, 247
 - metadata, 243–244
 - substitution, 246–247
- VBScript, 388
- Verification testing, 182
- Verity, 188
- Versioning, 48, 189
- VerticalNet, 188
- View, 283, 311
- Vocabulary, 34
 - annotation, 412–414
 - controlled, 175, 179, 182, 185–186
- VoiceXML, 454
- WBI, 414
- Web crawler, 53, 332, 348–350
- Web editor, 379, 382
- Web mining, 352–353, 355
- Web page
 - annotation, 52–53
 - dynamically created, 380
 - instances, 40
 - page splitting, 404, 411–421
 - queries, 172
 - tables, 416–417
 - template feature, 242–243, 337
 - XML documents as, 125
- Web server, 346–347
- Web site
 - AIFB, 318
 - metasearch, 224

- organization, 179
- personalization, 318, 332–333, 344–345
- Well-formed document, 32
- Well-formed ontology, 43
- Wireless Application Protocol (WAP), 452–454
- Wireless device, 363, 449–455
- Wireless Markup Language (WML), 452–455
- WOPlan, 449–455
- WorldNet, 11, 218–219, 324
- Work-around analysis, 255, 255–257
- Workflow Management Coalition (Womb), 433
- Workflow support, 439
- World view, 311
- World Wide Web (WWW), 7, 29–31, 141.
 - See also* Search; Web page
- architecture, 172–173
- browsing, 18–19, 179–180, 381–382, 385
- data on, 281, 289
- dynamic/static aspects of, 377–378, 431
- evolution and growth, 1, 223
- and knowledge bases, 253–254, 271–272
- as network, 378
- problem-solving, 226–230
- and SHOE, 51–52
- task-achieving agents, 431–432
- term hierarchies, 176
- Web crawler, 53, 332, 348–350
- Web editor, 379, 382
- Web mining, 352–353, 355
- Web server, 346–347
- Wrapper, 382
 - online stores, 5–6
 - querying, 58
- Xalan, 244
- XHTML, 9
- XML, 9–10, 31, 125, 136
 - ⟨I-N-OVA⟩ and ⟨I-N-CA⟩, 438
- DAML+OIL, 79
- DTD, 32, 103–104, 155
- electronic commerce, 7
- InfoQuilt, 283, 297
- keywords, 394
- procedural semantics, 389
- RDF, 34, 66, 199–202
- semistructured databases, 58
- SHOE, 36
- tags, 155
- templates, 235–236, 242–244
- VoiceXML, 454
- XML Schema, 96, 103–114
 - datatypes and structures, 104–107
 - multiple inheritance, 126–127
 - namespaces, 107–109
 - and OIL, 109–114, 121–124, 135–136
 - and UPML, 155–156
 - XML documents, 103–104, 125
- XPath, 406–407, 423
- XPointer, 406–407
- XQuery, 202
- XSB, 53–55
- XSL stylesheet, 36, 235, 244
- XSL Transformation Language (XSLT), 424
- Yahoo!, 33, 176, 351