

INDEX

Page numbers followed by *f* and *t* indicate figures and tables, respectively.

- A**
about capability, in RDF, 305–307
aboutness, in knowledge organization, 403–404, 434
A-Box, in description logics, 117
academic discussion threads, indexing of, 439
academic resources, organization of, with KOxTM, 445
AC arcs, in dRM, 58
active database systems, influence of expert systems on, 116
Adams, Douglas, 1*n*
addressable information resource. *See* resource(s)
addressing, in topic map standards and specifications, 25–26
advertising, on Internet, interchange structure of, 47
aggregation, in RDF, 316–319
aggregation systems, definition of, 167*n*
algorithm development, in logic programming, 118
Alt container, in RDF, 303–305
AM arc, in TMPM4, 57–58
ambiguity
 in subject identity, 68
 in topic maps, 18
Animalia kingdom, 152–155
 phyla of, 153, 153*t*
Animalia topic, construction of, 159–160, 161*f*
Animalia topic map, construction of, 156–157, 158*f*
AnimaliaTopicMap topic, construction of, 159, 160*f*
animals, definition of, 152–153
annotated bibliographies, interactive, topic maps for, 446
a-nodes (association nodes), 29
 in TMPM4, 57
AP arcs, in dRM, 58
application(s)
 in dRM, 57
 for information interpretation, 17
 for markup, sequential, 46
 in TMP3, 229–230
 architecture of, 230–231, 231*f*
 extension of, 243–244
 processing function of, 231–232
and topic maps, independence of, 18
for topic maps (*See* topic map applications)
application programming interface (API)
 DOM as, 46–47
 in TM4J, 211–213
 advanced features of, 223–225
 basic features of, 213–218
 vs. topic map interchange systems, 47
applied knowledge organization, purpose of, 401
arc(s)
 in dRM, 57–58
 in TMPM4, 57
 in topic map processing, 29
architectural forms
 vs. DTD, 53
 in ISO 13250, 26, 39
ART-Enterprise (Brightware), 112
artificial intelligence
 expert systems and, effect on, 113
 information repurposing with, xxi
 logic programming in, 117–118

- AS arc, in TMPM4, 57
- assertion(s). *See also* association(s)
vs. association, 59
 components of, 58, 58*f*
 definition of, 53, 57
 in dRM, 59*f*
 typing mechanism in, 60–62, 61*f*
- assertionPattern-role-
 rolePlayerConstraints
 assertion type, 58–59
- assertion types, 58–59
 semantics of, privileging, 62
- association(s), 88–90. *See also* assertion(s)
 as a-nodes in topic map graph, 29
vs. assertion, 59
 class-instance relationship as, 364–365
 in concept map, 4, 4*f*
 control over, 93
 creation of, in SemanText, 206, 206*f*
 in CTW generation, 169
 defining, 19
 definition of, 19, 532
 in early drafts of ISO 13250 standard, 38
 enumeration of, in TM4J, 216
 ID generation for, in TM4J, 216
 inferring, 352
 instances of, in knowledge representation example, 359
 in knowledge organization use case, 426
 querying and displaying, 195–197
 in RDF, 301–303, 305–307
 resolving, and a-nodes, 29
 roleSpec in, 90
 in semantic networks, 338–339
 sitemap controlled by, 195–196
 source of, scope for indicating, 175
 superclass-subclass relationship as, 363–364
 for TMP3
 creation of, 240–242
 defining, 228, 229*f*
 visualization of, 269
 in XTM specification, 54
- association classes
 constraints on, 375–377
 PSIs for, 361, 361*t*
- association member role,
 definition of, 532
- associationMembership handler,
 in GooseWorks Toolkit, 262
- association properties
 in knowledge representation, 359, 365–366
 for semantic networks, 332–333
- association role classes, PSIs for, 361, 361*t*
- associationScoping handler,
 in GooseWorks Toolkit, 262
- association template, definition of, 532
- associationTemplating handler,
 in GooseWorks Toolkit, 262
- association types. *See also* instanceOf
 definition of, 532
 in knowledge representation example, 358
 in semantic networks, 334–335
- assumptions, within book, xxii
- AT&T/Lucent, CLASSIC, 111
- attributes, *vs.* element types, 27
- attitude, topic maps, 48–50
- authority, in PSIs, 75, 76
- Automated Domain Analysis, topic maps for, 446
- avatars, in visualizations, 279, 279*f*
- AX arc, in TMPM4, 57
- axiomatic systems, in ontological engineering, 122
- ## B
- BACK, 117
- back-end layer, of XSLT style sheets in CTW, 182
- backward chaining, in expert systems, 114
- bag structure, in RDF, 303–305, 309–311
- base name, 84–85
 in CTW generation, 169, 184
 definition of, 533
 querying and displaying, in CTW framework, 190–191
 and scope, 87–88
- baseNameString, 84–85
- base name topic, definition of, 532
- Berkeley, Mercury Prolog, 118
- Berners-Lee, Tim, World Wide Web design of, 39
- bibliographic databases, topic maps in, 449–452, 450*f*, 451*f*
- bibliographies, annotated, interactive, topic maps for, 446
- Biezunski's Principle, 38–39
- binary relations, in semantic networks, 329–330
- Bosak, Jon, on money as document, 33
- boundaries, foundational theories for, ontological, 119
- bounded object sets, in HyTime addressing, 26
- Bravo (Global Wisdom), 65
- Brightware, ART-Enterprise, 112

business category brokering,
topic maps for, 446

C

canonical syntax, constructs for,
documentation for, 62

CAPh (Conventions for
the Application of
HyTime), 38

categories

knowledge as, 399
in knowledge organization,
395, 397, 404–405
sound design of, 432–433
theory of, 398

C code, in logic programming,
118

central concept, in Semantic
Web, 481, 481*f*

channels, use of, 188

CHIP, 118

Chordata phylum, 154, 154*f*

chunking, 499

city metaphor, for visualizations,
279–280, 280*f*, 281*f*

civilization, global knowledge
interchange and,
importance of, 48

class

definition of, 92, 533
vs. instance, 334
as instance of other classes,
189–190
PSIs, 361, 361*t*

class hierarchies

constraints on, 379–380
in knowledge representation,
359, 362–365

CLASSIC (AT&T/Lucent), 111,
117

classification, history of, 150

class-instance relationship

definition of, 533
in knowledge representation,
362
as association, 364–365
PSIs for, 364*t*

CLIPS (NASA), 112

Cogitative Topic Map Websites
framework. *See* CTW
framework

collocation, of subjects, in
knowledge organization,
403–404

communication

changes in style of, 478
symbolic nature of, 43–44,
48–49

communities

KOS construction in, 431–432
PSIs in, 75–76

complexity, in standards, and
simplicity, relation of, 24

compositional modeling,
for ontology encoding,
120

Computational Logic, Inc., 111

concept(s)

in knowledge organization,
395, 397, 405
understanding, and learning,
496–498

concept map

in education, 519–520
history of, 485–486
as topic map, 3–4, 4*f*, 442–443
XTM document for, 5–7

conceptual graphs, history of,
486

conceptualization, definition of,
124

conceptual model, as ontology,
125, 126*f*

concurrent constraint logic
programming, 118

connectivity, in Semantic Web,
482–483, 483*f*

constraint(s)

on class hierarchies, 379–380
in knowledge representation,
359, 373–374
example of, 375–379
PSIs for, 375*t*
in topic maps, 339–340

constraint patterns, for
knowledge represen-
tation, 374–375

constraint programming,
117–119

companies in, 111
in Web-based technologies,
119

constraints and queries layer, of
road map of forthcoming
ISO topic maps standards,
63–64

constructivist learning

collaboration in, 518, 519*f*
dominance of, 486
environments for, 514–515,
516*f*

principles of, 513–514
in Semantic Web, 512–513
theory of, 495, 513
topic maps in, 13, 14–15

constructivist viewpoint, of
subject identity, 68

contexts/microtheories method,
for ontology encoding,
120

Conventions for the Application
of HyTime (CApH), 38

conversation

subject emergence through,
68–69
subjects of

addressability of, 49
and symbolic communica-
tion, 43–44, 49, 78

Converter modules, in TMP3,
230

CR arcs, in dRM, 58

critical thinking

definition of, 512
structure of, 517, 517*f*

CTW (Cogitative Topic Map
Websites) framework

content in, as structured
cognitive system, 169
design in, 169, 172–173
information styled in, 172

- CTW (*cont.*)
 layers of, 168
 maintaining source code with, 168–169
 merging in, 174
 resolution levels in, 188
 source code generated with, for Web sites, 171–173, 177–178, 179*f*
- Cx arcs, in dRM, 58
- CyberDewey, 417–419
- cybernetic knowledge mapping, history of, 485
- Cyc (Cycorp), 111, 119
- D**
- DARPA, Knowledge Sharing Effort, 120
- DARPA Agent Markup Language (DAML), 22, 120, 124
 for knowledge organization semantics, 415
- data
 annotation of, for computer-assisted interpretation, 107
 definition of, 104
 and documents, relation of, 22
 and knowledge, relation of, 105
vs. metadata, 40
 subject-centric view of, 42–45
 use of term, 104
- database(s)
 relationships in, 125
vs. topic maps, 17–18
- database(s), deductive, logic programming in, 118
- database(s), relational
 as documents, 46
 information of, on Internet, 106
 purpose of, 106
 SQL in, 250–251
- database systems, active, expert systems and, influence on, 116
- data models, *vs.* ontologies, 125
- Davenport Group, in topic maps history, 37
- declarative domain knowledge, encoding of, 119–120, 122
- deductive databases, logic programming in, 118
- deep knowledge management, 107
- description
 in knowledge organization, 396
 in RDF, 286, 286*f*
- description logics, 116–117
- deserialization, definition of, 533
- Dewey Decimal Classification, mapping to Library of Congress Subject Headings, 419–422, 420*t*, 421*t*
- dimensions of knowledge, 400–401
- display names (ISO), 20
vs. variant names, 27, 54
- diversity, in topic maps paradigm, 48
- DOCTYPE line, in topic maps, 98
- document(s)
 connotation of term, 46
 and data, relation of, 22
 money as, 33
 relational databases as, 46
- document() function, use of, 193–194
- Document Object Model (DOM), disadvantages of, 46–47
- document type definition. *See* DTD
- DOM. *See* Document Object Model
- domain(s), Linnaean, 152*n*, 154, 154*f*
- domain theory
 encoding of, 122
 logical, as ontology, 125, 126*f*
 in ontologies, 122
- DOMXIncluder, 194
- draft Reference Model. *See* dRM
- drill-down topic maps, 12, 155, 157*f*
- dRM (draft Reference Model). *See also* RM
 arc types in, 58
 assertion types in, 58–59
 patterns for, 60–62, 61*f*
 assertion *vs.* association in, 59
 compliance with, in
 GooseWorks Toolkit, 263
 construction rules for, 58
 in GooseWorks Toolkit, 260–265
 implementation of, traversing, 59–60, 59*f*
 querying of, in GooseWorks Toolkit, 264–265
 role player constraints in, 62
 serialization of, syntaxes for, 262–263
 TPM4 superseded by, 57
- DTD (document type definition) *vs.* SGML architectures, 53
 in syntax layer, in road map of forthcoming ISO topic map standards, 62
 for XTM specification, 26, 55
 mapping of, to TM4J interfaces, 213, 214*t*
- dual coding, 499
- Dublin Core, 23
 metadata items from, in RDF, 307–308, 321–325, 410–411
- dynamic visuals, language transmitted through, 480

- E**
- ECLiPSe, 118
- education
- knowledge mapping in, 485–487
 - semantic networks in, 486–487, 488–498, 489*f*, 490*f*
 - on Semantic Web, 512–513
 - topic maps in, 12, 14–15
(*See also* IBIS)
- e-journals, indexing of, 440
- element(s)
- of documents, 22
 - in XML, 81
- element types
- vs.* attributes, 27
 - meaning of, 47–48
- empolis K42, 64, 270, 272*f*
- emptiness, PSI for, 78
- EMYCIN, 114
- Enterprise JavaBeans (EJB), in Nexist, 251
- epistemology, in knowledge organization, 397
- error handling, in TM4J, 217, 217*t*
- ET-Maps, for visualization, 275, 276*f*
- Eukarya domain, 154, 154*f*
- events, foundational theories for, ontological, 119
- exception classes, in TM4J, 217, 217*t*
- expertise, in PSIs, 75, 76
- expert systems, 113–116
- and artificial intelligence, effect on, 113
 - backward chaining in, 114
 - benefits of, 115
 - capabilities of, 114
 - deficiencies of, 115–116
 - forward chaining in, 114
 - influence of, on active database systems, 116
 - knowledge bases based on, 112
 - knowledge representation tools based on, 111
 - rules in, 114
 - semantic networks for modeling, 329
 - single-level nature of, 113, 122
- explicit referencing
- constraint on, in STWOL, 181
 - in XTM, 28–29
- F**
- facet(s)
- creation of, in SemanText, 206, 207*f*
 - in early drafts of ISO 13250 standard, 38
 - in knowledge organization use case, 427
 - vs.* RDF, 293
 - and XTM specification, lack of, 29, 54
- facet analysis, in knowledge organization, 398, 405–406
- family tree
- as RDF illustration, 283–284, 283*f*
 - in semantic network, 481–482, 482*f*
 - topic map from, 327, 327*f*
- filtering. *See also* facet(s)
- of information, on Web, 41
- finding aids, for information location, 17
- five kingdoms, Linnaean, 150, 151–152, 152*t*
- FiveKingdoms topic map, construction of, 156–157, 158*f*
- f-logic, in On2broker and Ontobroker, 124
- formal languages. *See also* semantic(s)
- computing, 34–35
 - in knowledge representation, 109–110
 - in KOSs, 412–414
 - on World Wide Web, 35*n*
- formatting conventions, for XML in this book, 15
- forward chaining, in expert systems, 114
- frame-based indexing, in knowledge organization, 407–408, 422
- functional equivalence, in knowledge organization, 403–404
- G**
- G2 (Gensym), 112
- Galen (Generalised Architecture for Languages, Encyclopaedias and Nomenclatures in medicine) project, reuse of, in ontology-driven topic maps, 130
- GCARI (Graphic Communications Association Research Institute), CAPH hosted by, 38
- general interest information, PSIs and, usefulness of, 76–77
- generic markup. *See* SGML
- Gensym, G2, 112
- global knowledge interchange
- abstractions of, 32
 - SGML and, 36
 - importance of, in civilization, 48
 - increased understanding of, 49
 - infoglut and, problem of, 49
 - technological contributions to, 49
 - XML and, 36
 - XTM for, 10–11
- Global Wisdom, Bravo, 65
- glyphs, in interpretation, 105
- GML, 36. *See also* SGML

- GooseWorks Toolkit, 260–265
 current tools of, 265
 design of, 261–262
 ISO 13250 compliance in, 263
 and other software,
 comparison of, 200
 serialization of dRM in,
 syntaxes for, 262–263
 use cases for, 263
- Gowan's Knowledge, 517, 517*f*
- Graph. *See* RM
- Graphic Communications
 Association Research
 Institute (GCARI),
 CApH hosted by, 38
- graphic frame, in Semantic Web,
 481, 481*f*
- temporal relations in, 481, 482*f*
- GraphMaker, 247*f*
 in Nexist development, 245
 use cases for, 246–247
- graph visualization, 271–275
- GraphVisualizer 3D (Nvision),
 274, 275*f*
- grove
 definition of, 201*n*
 implementation of, in
 SemanText, 209
- H**
- hacking software, 13
- hermeneutics
 and knowledge, 399
 in knowledge organization,
 397
- High Performance Knowledge
 Base (HPKB) Project,
 120, 121
- HTML (Hypertext Markup
 Language)
 rendering of
 in CTW generation, 169
 sequential nature of, 46
 SGML in, 35
 topic map elements rendered
 in, 173, 173*t*
 XML transformation to, 7
 from XSLT style sheets, 184
 topic-specific, 184–186,
 187*f*
- HTML editors, *vs.* topic maps,
 for Web site maintenance,
 170, 170*f*
- HTML links, as topics, 19–20
- HTTP (Hypertext Transport
 Protocol), formal
 language in, 35*n*
- humans
 languages of, development of,
 478–479
 in Linnaean system, 150, 151*f*
 stupidity of, 1
- hybrid information, management
 of, 36–37
- hyperbolic geometry, for
 visualization, 273, 274*f*
- hyperedge, in TMPM4, 58
- HypersonicSQL, in Nexist
 database engine, 245,
 249–251
- Hypertext Transport Protocol
 (HTTP), formal language
 in, 35*n*
- HyTime
 inheritance in, 26
 in ISO 13250 addressing,
 25–26
 links in, 27
 for master indexes, 38
 origin of, 45*n*
- HyTM. *See* ISO 13250
- I**
- IBIS, 517–519
 implementation of, 521–525,
 522*f*
 with topic maps, 523–525,
 523*f*, 524*f*, 525*f*
 with XML, 523–525
- ID
 generation of, in TM4J, 216
 in knowledge organization use
 case, 427
 in Nexist, 259, 260*f*
 for TMP3, 228, 229*t*, 243
 in topic, 84
 requirements for, 84
- ID property, in TM4J, in
 TopicMapObject
 interface, 214
- IFF (Information Flow
 Framework), 124
- ILOG, 111
- implicit topics, creation of, in
 TM4J, 220–221
- indexes, master, maintenance of,
 37–38
- indexing
 back-of-the-book, classifi-
 cation in, 419
 frame-based, 407–408
 interpretive nature of,
 402–403
 KOxTM use cases in, 439–441
 relational, 407–408
 semantic markup in, 412–414
 views-based, 408, 423–424
- inference rules
 developing, in SemanText,
 208–209, 209*f*
 in knowledge representation,
 359, 366–367
 example of, 367–373
 relevance in, 434
 in semantic networks, 343–352
- infoglut, problem of, 40, 49
- information
 accessing, dimensions of, 17
 categorization of, conflicts in,
 42
 definition of, 105
 general interest, PSIs and,
 usefulness of, 76–77
 hiding, imperative of, 41
 hybrid, management of, 36–37
 locating, finding aids for, 17
 money as, 33
 and reality, relation of, 32–34,
 42–45
 styling of, in CTW, 172
 use of term, 104

- information continuum. *See* interpretation continuum
- information economy, 33
- information exchange, within communities, PSIs for, 75–76
- Information Flow Framework (IFF), 124
- information overlays. *See* topic map(s)
- information presentation approaches to, simplicity *vs.* complexity, 24
topic maps for, 17
- information repurposing, with artificial intelligence, xxi
- information resource(s)
as subject, 44
as surrogate for reality, 44–45
- Information Retrieval System (IRS)
function of, 403
knowledge organization in, 397
- information structure, 34
vs. interchange structure
in DOM, 45–46
in topic maps, 47, 49
requirements for, conflicting, 46
- information structuring, 22.
See also structured information; Web navigation
metadata for, 22–23
topic maps for, 23
- Information Systems
Institute/University of Southern California
LOOM, 111
PowerLOOM, 111
- inheritance hierarchies, semantic networks for modeling, 329
- inheritance mechanism, in ISO 13250, 26
- initialization function, in TMP3 classes, 232–236
- inquiry, in XTM specification, 11
- instance(s)
vs. class, 334
in knowledge representation example, 358–359
in several classes, 182, 188
in XSLT templates, 190
- instanceOf, 27, 90–93
- instance topic, definition of, 534
- IntelliCorp, KEE, 112
- interchange structure, *vs.* information structure
in DOM, 45–46
in topic maps, 47, 49
- interchange syntax, definition of, 534
- interpretation. *See also* semantic(s)
automation of, 106–107
computer-assisted, 107
and databases, relation of, 106
definition of, 105
knowledge as, 104
in knowledge organization structures, 402–403
- interpretation continuum, 104, 105*f*
annotated, 107, 108*f*
structured information in, 104
- intuition, in symbolic communication, 44
- IRS (Information Retrieval System)
function of, 403
knowledge organization in, 397
- ISO 10744. *See* HyTime
- ISO 13250 (topic maps standard), 11
addressing in, 25–26
architectural forms in, 26
definition of, 39
development of, 25, 38–39
disabilities of, 53
- layered approach of standards development process, 51, 52*f*
names in, 20
seminal character of, 51, 52*f*
simplification of, 23, 24*f*
syntax of, 39
vs. XTM specification, 53–54
- ISO topic maps standards (forthcoming)
layers in road map of, 55
relationships among, 55, 56*f*
- J**
- Java APIs, in TM4J, 211
advanced features of, 223–225
basic features of, 213–218
- Java packages, in TM4J, 211–213
- Jext, 246*f*
in Nexist development, 245
use cases for, 246–247
- K**
- KEE (IntelliCorp), 112
- key() function, in XSLT, 194–195, 196
- KIF (Knowledge Interchange Format), 120
- kingdoms, Linnaean, 150, 151–152, 152*t*
- KL-ONE, 116–117
for knowledge organization semantics, 415
- knowledge
component-based languages for, 120
for ontology encoding, 120
and data, relation of, 105
definition of, 104, 398–399, 507
dimensions of, 400–401
and hermeneutics, 399
as interpretation, 104

- knowledge (*cont.*)
 sharing of, techniques for,
 for component-based
 knowledge representation,
 120
 use of term, 104
- knowledge acquisition tools,
 domain-specific,
 ontological engineering
 as basis for, 121
- knowledge assets, federation of,
 and evolution of, 50
- knowledge availability, 49
- knowledge bases
 definition of, 112
 existing, topic maps for, 171
 intermediate, for Web site
 maintenance, 170, 171*f*
- knowledge bottleneck, in expert
 systems, 115
- knowledge construction, within
 communities, PSIs for,
 75–76
- knowledge engineering
 definition of, 112
 issues in, 113
 questions for, 112
 research threads in, 123, 123*f*
 XML topic maps in, 12
- knowledge fusion, definition of,
 110–111
- Knowledge Interchange Format
 (KIF), 120
- knowledge languages, for
 component-based
 knowledge representation,
 120
- knowledge management
 definition of, 107
 semantic interpretation in,
 110
 topic maps for, 353–354
 vs. HTML editors, 170,
 170*f*
 XTM as API for, 252
- Knowledge Manager (Mondeca),
 64
- knowledge mapping, history of,
 485–487
- knowledge networks
 in KOxTM use case, 425–426
 semantic interoperability in,
 387–388
 topic maps for management of,
 17–18
- knowledge organization (KO),
 389–390
 abbreviations in, 474–476
 aboutness in, 403–404
 applied, purpose of, 401
 categories in, 395, 397,
 404–405
 theory of, 398
 collocation in, of subjects,
 403–404
 concepts in, 395, 397, 405
 context-dependency of,
 400–401
 definition of, 385, 392–393
 facet analysis in, 398, 405–406
 formal semantics in, 414–416
 frame-based indexing in,
 407–408, 422
 functional equivalence in,
 403–404
 history of, 391
 inquiry aided by, 386
 in IRSs, 397
 and knowledge representation,
 relation of, 412–414
 knowledge structures in,
 385–386, 399
 metadata in, 410–412
 and ontological engineering,
 408–410
 ontologies in, 408–410
 postmodern theory of,
 399–400
 principles of, 389–390,
 397–398
 problems in, 390–391, 397–398
 in PSI architecture, 387
 purpose of, 384, 385–386,
 393–394
- relational indexing in,
 407–408, 422
- relations in, 395, 397, 406–407
- relevance in, 403–404
- resources on, topic map of,
 447–448
- semantic interoperability in,
 416–417
- semantic retrieval in,
 395, 408
- sound design of, 432–433
- theory of, 394–395
- and topic maps
 future of, 449–452
 impediments to adoption of,
 428–430
 merging in, 436–438
 overlap between (KOxTM),
 384–385, 386–391
 potential value of, 427–428
 recurring challenges in,
 430–438
 relation of, 386
 uses of, 439–447
 as topic map use case, 424–438
 views-based indexing in, 408
- knowledge organization systems
 (KOS), 387. *See also*
 ontology(ies)
- construction of, within
 communities,
 431–432
- decentralized, 438
- elements of, mapping between,
 419–422, 420*t*
- export of, to topic maps, 433,
 441–442
- form of, 401
- quality assurance for, 389–390
- registry for, for metadata
 usage, 410–412
- semantic markup in, 412–414
vs. topic maps, 428
- universal, 401–402
vs. domains, 431–432
 for internet resources,
 417–419

- knowledge repositories
 multiview indexing of, 440
 topic maps in, 443–444
- knowledge representation (KR)
 association properties in,
 365–366
 basic concepts of, 359–360
 class hierarchies in, 362–365
 class-instance relationship in,
 as association, 364–365
 constraint patterns for,
 374–375
 constraints in, 374–375
 example of, 375–379
 PSIs for, 375*t*
 design issues in, 111–112
 example of, 357–359
 general issues in, 110–111
 inference rules in, 366–367
 example of, 367–373
 PSIs for, 373*t*
 and knowledge organization,
 relation of, 412–414
 levels of, classification of,
 109–110, 110*t*
 questions for, 109
 research threads in, 123,
 123*f*
 semantic interoperability in,
 388
 software for, 111, 127
 superclass-subclass
 relationship in, as
 association, 363–364
 in topic maps, 507, 520
 topic map templates in,
 360–362
- Knowledge Sharing Effort
 (DARPA), 120
- knowledge structures
 in knowledge organization,
 385–386, 397, 399
 semantic interoperability in,
 388
- Knowledge Suite (Ontopia), 64
- knowledge technologies, premise
 of, 119
- knowledge web, topic maps as,
 477
- KO. *See* knowledge organization
 (KO)
- Kontext semantic network, 443
- KOS. *See* knowledge organiza-
 tion systems
- KOxTM. *See* knowledge
 organization (KO), and
 topic maps
- KR. *See* knowledge represen-
 tation
- Krypton, 117
- L**
- language. *See* formal languages;
 natural language
- layout layer, of XSLT style sheets
 in CTW, 182–187
- legal evidence, topic maps for,
 447
- Leggewie, Claus, 450, 450*f*,
 451*f*
- Library of Congress Subject
 Headings, mapping to
 Dewey Decimal
 Classification, 419–422,
 420*t*, 421*t*
- LIFE, 118
- life sciences, topic map of,
 purpose of, 149
- likeness. *See* functional
 equivalence
- link(s), in semantic networks,
 328, 328*f*
- link information, management
 of, with topic maps,
 19–20
- Linnaean system of classification,
 kingdoms in, 150
- Linnaeus, Carlous, classification
 system of, 150
- Linux, open source status of,
 200
- liquids, foundational theories for,
 ontological, 119
- literature, *vs.* science, xxi
- logical domain theory, as
 ontology, 125, 126*f*
- logic programming, 117–119
 in artificial intelligence field,
 117–118
 C code in, 118
 in database technology,
 118
 multiparadigm languages for,
 118
 synthesis languages for, 118
 systems for, 111
 WAM-based, 118
 in Web-based technologies,
 119
- LOOM (Information Systems
 Institute/University of
 Southern California),
 111, 117
- Lucid Fried Eggs, 202
- M**
- M.4 (Teknowledge), 112
- magazines, indexing for, 440
- MAK (Mind Map and
 Knowledge Manage-
 ment), 201, 201*f*
- map(s)
 vs. territory, 2
 usefulness of, 2
- Mapper modules, in TMP3,
 230
- map visualization, 275–278
- markup applications, sequential,
 46
- master indexes, maintenance of,
 37–38
- MDF (metadata processing
 framework), 230
- member, 89–90
 control over, 93
- Mercury Prolog (Berkeley),
 118
- mereotopology, foundational
 theories for, ontological,
 119
- mergeMap, 93–97

- merging. *See also* name-based merging rule; subject-based merging rule
 benefit of, 96
 of CTW-based Web sites, 174
 definition of, 534
 of ontologies, 120, 130
 processing in, 47
 in topic maps, and knowledge organization, 436–438
 of topic maps, 20–21
 in *SemanText*, 207
 of topics
 with scopes, 20–21
 in *TM4J*, 223–224
- metadata
vs. data, 40
 decentralized, 438
 description of, need for, 50
 from Dublin Core, in RDF, 307–308, 321–325, 410–411
 maintenance of, 171
 in ontologies, 122
 and Platonic forms, 42
 resource-centric view of, 43, 49
 from SGML, 36
 structure of, RDF for, 284–285
 for Web navigation, 22–23
- metadata processing framework (MDF), 230
- metalevel dialogue, subject emergence through, 68–69
- metaproperties, foundational theories for, ontological, 120
- Mind Map and Knowledge Management, MAK, 201, 201*f*
- modeling layer, of road map for forthcoming ISO topic maps standards, 55. *See also* RM; SAM
- modules, in metadata processing framework, 230
- Mondeca
 Knowledge Manager, 64
 Topic Navigator, 270, 272*f*
- money
 as document, 33
 as information class, 33
- multiparadigm languages, for logic programming, 118
- multivalued properties, in *TM4J*, 227
- music, abstract representation of, 45–46
- MYCIN, 114
- N**
- naïve viewpoint, of subject identity, 67–68
- name(s)
 absence of, 19–20
 in CTW generation, 169
 merging, and knowledge organization, 436–438
 number of, 19–20
vs. PSIs, for subject identity, 74
- name-based merging rule, 21
 definition of, 541
 mergeMap in, 95
 and subject-based merging, interaction of, 96–97
 in *TM4J*, 223
- namespaces
 declaration of, in XSLT, 186–187
 definition of, 21, 541
 in RDF, 288–290, 289*f*, 290*f*
 in topicMap, 98
 naming constraint, topic, definition of, 541
- NASA, CLIPS, 112
- natural language, 478–479
 in knowledge representation, 109–110
 marked-up, 45*n*
 structure of, 34
 in topic maps, scope for, 82
 transmission of, 479–480
- natural language generated (NLG) text fragments, 173*n*
- natural language input interface, in *SemanText*, 210
- navigation requirement, for visualization, 268, 269–270
 in graphs and trees, 273–275
 in virtual worlds, 280
- network address handling, in *TM4J*, 218
- Newcomb, Peter J., and Victoria T. Newcomb, Whataburger model for topic maps by, 38
- Nexist
 design requirements for, 249
 development of, 245
 early stages of, 248*f*
 future plans for, use cases for, 249
 HypersonicSQL in, 245
 and other software, comparison of, 200
 persistent storage in, 245
 use cases for, 248
SemanText in, 245
 use cases for, 245–249
 user interface for, 254–259
 Web site address for, xxii
 XTM specification in, use cases for, 248
- NicheWorks, for visualization, 275, 276*f*
- NLG (natural language generated) text fragments, 173*n*
- node(s)
 in dRM, 57
 in semantic networks, 328, 328*f*
 in topic map processing, 29
- nonaddressable subject, definition of, 535

notations, in interpretation, 105
Nvision, GraphVisualizer 3D,
274, 275*f*

O

- OASIS (Organization for the Advancement of Structured Information Standards), 55
- occurrence(s), 84–85
construction of, 160, 161*f*,
162*f*, 163, 163*f*
creation of
in Nexist, 257–259, 259*f*
in SemanText, 206, 207*f*
in CTW generation, 169,
186
definition of, 18, 535
querying and displaying,
192–195
role types for
formatting for, 192
in knowledge organization
use case, 426
for TMP3, creation of,
240–242
of topic characteristics,
188–189
- occurrence classes
in knowledge representation
example, 358
PSIs for, 361, 361*t*
- occurrence type, definition of,
535
- OIL (Ontology Inference Layer),
120–121, 124
for knowledge organization
semantics, 415
- OKBC (Open Knowledge Base
Connectivity) language,
120
- OML/CKML (Ontology
Markup Language/
Conceptual Knowledge
Markup Language), 124
for knowledge organization
semantics, 415
- omnigator (Ontopia Navigator),
270, 271*f*
- Ontobroker, 124
- On2broker, 124
- Ontolingua/Chimaera (Stanford
University Knowledge
Systems Laboratory), 111,
120
- ontological engineering
applications of, and Web, 124
definition of, 107*n*, 120, 121*f*
and domain-specific
knowledge acquisition
tools, basis for, 121
and knowledge organization,
408–410
multilevel nature of, 122
ontologies defined in, 122
requirements in, 119
topic maps in, 12
- ontology(ies)
building, 126–129
coding of, with XTM,
127–128
components of, 125
composition of, technologies
for, 120
convergence of, PSIs in, 75
vs. other data models, 125
definition of, 122, 124–125,
409–410
design consideration for, 127
domain theory in, 122
encoding, 120
existing, reuse of, 130
in knowledge organization,
408–410
merging of, 130
technologies for, 120
metadata in, 122
multiple uses of, 130
relationships in, 125, 127
spectrum of, 125, 126*f*
and topic maps, comparison of,
125–126
topics of (*See* topic map
templates)
- universe of discourse for, 127
of Web sites, design of, 171
- ontology-driven topic map(s),
129
advantages of, 129–131
future of, 131–132
knowledge reuse with, 130
- Ontology Inference Layer (OIL),
120–121, 124
for knowledge organization
semantics, 415
- Ontology Markup Language/
Conceptual Knowledge
Markup Language
(OML/CKML), 124
for knowledge organization
semantics, 415
- Ontopia, Knowledge Suite, 64
- Ontopia Navigator, omnigator,
270, 271*f*
- OntoSeek, 124
- Open Knowledge Base
Connectivity (OKBC)
language, 120
- Open Knowledge Systems* series,
purpose of, xxii
- open source software
about, 199–200
for topic maps, 13
- OPS5, 114
- order-sorted unification, in logic
programming, 118
- Organization for the Advance-
ment of Structured
Information Standards
(OASIS), 55
- Oz, 118

P

- parallel constraint logic
programming, 118
- parallel logic programming,
118
- parameters element type, 98
- PARKA (University of
Maryland), 111
- PARLOG, 118

- patterns, for typing assertions, in dRM, 60–62, 61*f*
- Performance semantic network, 443–444
- persistent storage
in Nexist, 245, 249–251
and SQL, 250–251
use cases for, 248
in TM4J, 211, 212
- persistent XTM engine, in Nexist, 249–251, 252*f*, 253*f*
- phyla
of Animalia kingdom, 153, 153*t*
number of, 152
- physical objects, foundational theories for, ontological, 119
- PITs (Populated Information Terrains), for visualization, 279, 279*f*
- “planet”
meaning of, 69–73, 70*f*, 71*f*, 73*f*
PSI for, 77–78, 78*f*
- Planet 9 Studios, visualization developed by, 279, 280*f*
- Platonic forms, and metadata, 42
- polynomial, definition of, 150*n*
- Populated Information Terrains (PITs), for visualization, 279, 279*f*
- PowerLOOM (Information Systems Institute/ University of Southern California), 111
- presentation layer, of XSLT style sheets in CTW, 182
- principled knowledge organization, 389–390
- printing, language transmitted through, 479–480
- problem-solving methods, encoding of, 119
- procedural markup, *vs.* generic markup, 36
- processing model, for XTM specification, 29
- Producer modules, in TMP3, 230
- programming modules,
repository for, indexing of, 439
- Prolog, 117–118
- properties, foundational theories for, ontological, 120
- property change listeners, in TM4J, 225–227, 225*t*–226*t*
- property types, in RDF, 285
disambiguating, 288–290, 289*f*, 290*f*
- Protégé-2000 (Stanford University Medical Informatics Laboratory), 111, 121, 127
- pseudodescriptors, in knowledge organization, 396
- PSIs (Published Subject Indicators)
best practices for, development of, 55
changing nature of, 77–78
context for, necessity of, 76–77
definition of, 73, 535
for inference rules, in semantic networks, 343
for inquiry disambiguation, 11
knowledge organization applied to, 387
in knowledge representation, 360
for classes, 361, 361*t*
for class-instance relationship, 364*t*
for constraints, 375*t*
for inference rules, 373*t*
for superclass-subclass relationship, 363, 363*t*
for transitive relationships, 365*t*
vs. names, for subject identity, 74
in Nexist, 256, 258*f*
for nonaddressable subjects, 49
quality requirements for, 75
registries for, 441–442, 449
ontology-bound, 433
semantics assigned from, 331–332
in TMP3, subjects defined by, 236–240
for topic maps, Web address for, 77
for TopicMap topic, 158, 159*f*
updating, 88
and variant names, relation of, 54
- Published Subject Indicators. *See* PSIs
- published subjects
for Web navigation, 23
in XTM specification, 29
- Q**
- QuestMap, 515, 516*f*
- Quintus, 111
- R**
- Rapid Knowledge Formation (RKF), 120, 121
- RDF (Resource Description Framework)
about capability in, 305–307
aggregation in, 316–319
Alt container in, 303–305
associations in, 301–303, 305–307
bag structure in, 303–305
data model of, 285–288
deployment of, 428–429
description in, 286, 286*f*
extensibility of, 292–293
vs. facets, 293
family tree as illustration of, 283–284, 283*f*
markup of, *vs.* XTM, 297, 299–300
metadata in, from Dublin Core, 307–308, 321–325, 410–411

- for metadata structure, 284–285
- in On2broker and Ontobroker, 124
- property types in
 - definition of, 285
 - disambiguating, 288
- reification in
 - of statements, 311–314
 - of topics, 300–301
- relational data structures in, 320–321
- resources in, definition of, 285
- scope and, 294–295
- and semantic interoperability, 388
- and semantic networks,
 - comparison of, 330
- semantic networks built with, 293
- in Semantic Web, 17–18
- Sequence container in, 303–305
- sorted data structures in, 315–316
- statements in, 286–287, 287*f*
 - multiple, 307–309
 - RDF statements about, 311–314
- and topic maps
 - combination of, 295–296
 - comparison of, 292–293, 294–295, 330
 - relation of, 18
 - values in, 285–286
- XML in, 285, 288–291
 - namespaces in, 288–290, 289*f*, 290*f*
 - and XTM specification, 14
- RDFS (RDF Schema), 291–292
 - vs.* topics, 293
- ready-to-use topic map,
 - definition of, 535
- reality
 - and information, relation of, 32–34, 42–45
- information resource as
 - surrogate for, 44–45
- symbolic representation of, 43–44, 48–49
- redundancy-elimination, in topic map processing, 47
- reference merge, in SemanText, 207
- Reference Model (RM), 55–62.
 - See also* DRM
 - purpose of, 56
- referencing, explicit
 - constraint on, in STWOL, 181
 - in XTM, 28–29
- reflexive relationships, in semantic networks, 328–329
- reification, 67
 - definition of, 28, 535
 - of occurrences, 159
 - of statements, in RDF, 311–314
 - of topic maps, by root topic, 174
 - of topics, in RDF, 300–301
- relation(s)
 - in knowledge organization, 395, 397, 406–407
 - sound design of, 432–433
 - understanding, and learning, 496–498
- relational data structures, in RDF, 320–321
- relational indexing
 - in knowledge organization, 407–408, 422
 - topic maps in, 434
- relevance
 - in knowledge organization, 403–404
 - topic maps in, 434
- representation
 - dual, in Semantic Web, 490–491, 490*f*
 - of incomplete knowledge, in topic maps, 431
 - in subject construction, 68
- representation requirement, for visualization, 268–269
 - in graphs and trees, 271–273
 - in maps, 275–278
 - in virtual worlds, 279–280
- research fronts, topic maps for, 446
- resolution levels, in CTW framework, 188
- resolution principle, 117
- resource(s)
 - definition of, 19, 531
 - interchangeable, structure of (*See* interchange structure)
 - subject-indicating *vs.* subject-constituting, 19, 28–29, 53
 - as topics, 27–28
- resource(s), RDF, 289–290
 - definition of, 285
 - description of, RDF Schema for, 291–292
 - with multiple statements, 307–309
 - sharing, 315–316
 - unique identifiers for, 287
- resourceData, 98
 - in XSLT templates in CTW, 193
- Resource Description Framework. *See* RDF
- resourceID property, in TM4J, 214–215
- resourceRef
 - in explicit referencing, 28
 - inside member element, 89*n*
 - and resourceData, use of, 98
 - for subject identification, 86
 - vs.* subjectIdentity, 86
 - in XSLT templates, 193
- Rete algorithm, production systems based on, 114
- reusable knowledge components,
 - for ontology encoding, 120
- RKF (Rapid Knowledge Formation), 120, 121

- RM (Reference Model), 55–62.
See also dRM
 purpose of, 56
 role(s)
 definition of, 536
 topics for, 89–90
 role player, definition of, 536
 roleSpec, 89–90
 control over, 93
 root topic in CTW
 source code for, 175, 176*f*
 topic map reified by, 174
 Web page generation for, 174–175
- Rubinsky, Yuri, SGML video by, 31
- rule(s)
 in expert systems, 114
 for inference (*See* inference rules)
- S**
- SAM (Standard Application Model), 56–57, 62
- Sandberg, Anders, on human stupidity, 1
- SC arc, in TMPM4, 57–58
- science, role of, in daily life, xxi
- scope, 87–88
 association source indicated in, 179–180
 definition of, 20, 536
 in early drafts of ISO 13250 standard, 38
 in knowledge organization use case, 427
 merging topics with, 20–21
 for natural languages, 82
 occurrence source indicated in, 186
 in RDF, *vs.* topic maps, 294–295
 and s-nodes, 29
 in TM4J, 224–225
 for TMP3, 228
 unconstrained (*See* unconstrained scope)
- uses of, 20–21
 for association source, 175
 visualization of, 269
- scopic, definition of, for CTW, 190–191
- scoping topic(s)
 definition of, 536
 function of, in STWOL, 177
 multiple, 195
- scoping topic classes, PSIs for, 361, 361*t*
- search engines
 disorganization of, 41
 semantic interpretation and, 103
- sea-star topic element, source code for, 177–178, 179*f*
- self-organizing map (SOM)
 algorithm, for visualization, 275–277, 277*f*
- SemanText
 function of, 204
 future plans for, 209–210
 inference rules in, developing, 208–209, 209*f*
 in Nexist, 245
 use cases for, 248
 and other software, comparison of, 200
 output formats of, 210
 topic map creation in, 204–207, 206*f*
 topic map merging in, 207
 Web address of, 210
- semantic(s). *See also* formal languages; interpretation
 definition of, 508
 formal
 in knowledge organization, 414–416
 in KOSs, 412–414
 in topic maps, 435–436
 interpretation of, in knowledge management, 110
 from PSIs, 331–332
- statistics for inference of, 106–107
 in topic map architecture, 18, 25
- semantic heterogeneity, 416
- semantic indexing, in knowledge organization, 395
- semantic interoperability
 in knowledge networks, 387–388
 in knowledge organization, 416–417
 through ontologies, 125–126
 in topic maps, 436–438
- semantic networks, 328–330
 association properties for, 332–333
 binary relations in, 329–330
 connectivity in, 482–483, 483*f*
 constraints in, 339–340
 construction of, and learning process, 492–494
 creation of
 with RDF, 293
 in SemanText, 204
 with topic maps, 293
 definition of, 328, 508–509
 in education, 486–487, 488–498, 489*f*, 490*f*
 family tree in, 481–482, 482*f*
 formalization of, 116–117
 inference rules in, 343–352
 information extraction from, 353
 in KOxTM use cases, 442–444
 modeling with, 329
 for procedural knowledge, 499
 and RDF, comparison of, 330
 reflexive relationships in, 328–329
 symmetric relationships in, 329
 teaching with, 494–496
 and topic maps, comparison of, 330
 transitive relationships in, 328, 337

- validation in, 340
- weightings in, in *SemanText*, 210
- semantic retrieval
 - in knowledge organization, 395, 408, 422
 - topic maps in, 434
- Semantic Web
 - connectivity in, 482–483, 483*f*
 - definition of, 508–511
 - development of, 480–484
 - dual representations of, 490–491, 490*f*
 - education on, 512–513
 - languages in, 124
 - meanings shared on, 507, 509–510
 - navigation on, 484
 - RDF in, 17–18
 - structure of, 509
 - subject identity in, 74
 - systems in, 124
 - topic maps in, 2, 17–18, 511
- SemNet, 486–487, 487*f*, 515, 516*f*
- Sequence container, in RDF, 303–305
- serialization
 - definition of, 536
 - of dRML, syntaxes for, 262–263
- server, for Nexist, user interface for, 254, 254*f*, 255*f*
- set, definition of, 536
- SGML (Standard Generalized Markup Language)
 - description of, need for, 50
 - evolution of, 45
 - flexibility of, 49
 - in HTML, 35
 - on Internet, 53
 - metadata from, 36
 - in origin of XML, 23, 24*f*
 - problems with, 36
 - vs.* procedural markup, 36
 - purpose of, 31, 35–36
- topic maps built from parsing, 206–207, 208*f*
- for Web, 35
- shell topic maps, in drill-down technique, 156
- SHOE (Simple HTML Ontology Extension), 124
- and semantic interoperability, 388
- simplicity, in standards, and complexity, relation of, 24
- site map, of Web sites, control of, with association, 195–196
- Sixtus, 111
- s-nodes (scope nodes), 29
- in TMPM4, 57
- SOFABED (Standard Open Formal Architecture for Browsable Electronic Documents), 38
- software, open source. *See* open source software
- software applications. *See* application(s)
- SOM (self-organizing map)
 - algorithm, for visualization, 275–277, 277*f*
- sorted data structures, in RDF, 315–316
- sort key names (ISO), 20
- vs.* variant names, 27, 54
- Sourceforge, projects hosted by, 200
- space, foundational theories for, ontological, 119
- Special Topic Map Website Ontology Layer. *See* STWOL
- stability, in PSIs, 75
- Standard Application Model (SAM), 56–57, 62
- Standard Generalized Markup Language. *See* SGML
- Standard Open Formal Architecture for Browsable Electronic Documents (SOFABED), 38
- standards, creation of, 24–25
- Stanford University Knowledge Systems Laboratory, Ontolingua/Chimaera, 111
- Stanford University Medical Informatics Laboratory, Protégé-2000, 111
- start tag, definition of, 36
- statements, in RDF, 286–287, 287*f*, 291–292
- multiple, 307–309
- RDF statements about, 311–314
- reification of, 311–314
- resources shared between, 315–316
- stochastic methods, for interpretation
 - automation, 106–107
- structured information
 - in interpretation continuum, 104
 - vs.* unstructured information, 34
- student resources, organization of, with KOxTM, 445
- STWOL (Special Topic Map Website Ontology Layer), 176–182
 - concept of, 176–177
 - topics in, 176
 - as instance of several classes, 182
 - layout function of, 177
 - referential constraint on, 182
 - source code for, 180–181
- subject(s) of conversation
 - addressability of, 49
 - and symbolic communication, 43–44, 49, 78
- subject(s) of topics
 - computer access to, 43
 - construction of, representations in, 68
 - defining, viewpoints on, 67–68

- subject(s) of topics (*cont.*)
 definition of, 19, 537
 emergence of, in natural conversation, 68–69, 69–73, 70f, 71f, 73f
 identity of (*See also* subjectIdentity)
 ambiguity in, 68, 74
 duplicating, 86
 viewpoints on, 67–68
 information resource as, 44
 merging, and knowledge organization, 434
 nonaddressable, definition of, 535
 and resources, relation of, 19, 28–29
 as t-node in topic map graphs, 29
- subject-based merging rule, 21
 definition of, 537
 mergeMap in, 95
 and name-based merging, interaction of, 96–97
 in TM4J, 223–224
 in XTM processing model, 29
- subject-based Topic Map Query Language (sTMQL), in GooseWorks Toolkit, 264–265
- subject-centric view, of data, 42–45
- subject-constituting resource
 definition of, 537
vs. subject-indicating, 19, 28–29, 53
- subjectEquivalence handler, in GooseWorks Toolkit, 262
- subject gateways, quality-controlled, topic maps for, 445–446
- subject identity, 85–87
 definition of, 537–538
 empty, 98–99
vs. resourceRef, 86
- subject identity point, definition of, 538
- subject-indicating resource
 definition of, 538
vs. subject-constituting resource, 19, 28–29, 53
- subjectIndicatorRef
 in explicit referencing, 28
 inside member element, 89*n*
- subphyla, Linnaean, 152*n*
- subtype topic, definition of, 539
- superclass-subclass relationship
 in knowledge representation, 359, 362
 as association, 363–364
 PSIs for, 363, 363*t*
 in semantic networks, 334, 336
- supertype-subtype association, definition of, 539
- supertype topic, definition of, 539
- SWAGs, 2
- symbol(s), interpretation of, 105
- symbolic communication, 43–44, 48–49
- symmetric relationships, in semantic networks, 329
- syndication systems, definition of, 167*n*
- syntactic interoperability, through topic maps, 125–126
- syntax
 canonical, constructs for, documentation for, in syntax layer, 62
 serialization of, in dRM, 262–263
 syntax layer, in road map of forthcoming ISO topic map standards, 62
- synthesis languages, for logic programming, 118
- Systematifier, 392
- T**
- tag names
 length of, in XTM specification, 54
 meaning of, 47–48
- TalvaStudio, 194
- TAO (topics, associations, and occurrences), 65
- taxonomy, as ontology, 125, 126f
- T-Box, in description logics, 117
- teaching, with semantic networks, 494–496
- technology, role of, in daily life, *xxi*
- Teknowledge, M.4, 112
- telephone numbers, as formal languages, 34–35
- television, language transmitted through, 480
- template, definition of, 361
- temporal relations, in Semantic Web, 481, 482f
- terminological logics. *See* description logics
- territory, *vs.* map, 2
- text word indexing, 440–441
- ThemeScape, for visualization, 277–278, 278f
- Thinking semantic network, 443–444
- thought
 ephemeral nature of, 487–488
 writing pattered after, 498
- time, foundational theories for, ontological, 119
- TM4J
 distribution of, organization of, 211, 212f
 error handling in, 217, 217*t*
 export process of, 221, 221f
 extensions of, 244
 implicit topics in, 220–221
 Java APIs of, 211–213
 advanced features of, 223–225
 basic features of, 213–218
 element types of XTM DTD mapped to, 213, 214*t*
 network address handling in, 218

- object properties in, 225*t*–226*t*
- and other software,
 - comparison of, 200
- property change listeners in, 225–227, 225*t*–226*t*
- scope in, 224–225
- TopicMapObject interface of, 214–215
- topic maps in
 - creation of, 215
 - loading, 218–220
 - saving, 221–223
- topic merging in, 223–224
- unconstrained scope in, 224–225
- utilities in, 215–217
- TMCL (Topic Map Constraint Language)
 - development of, 340
 - user requirements for, 63–64
- TMP3
 - applications in, 229–230
 - architecture of, 230–231, 231*f*
 - extension of, 243–244
 - processing function of, 231–232
 - classes in, initialization
 - function in, 232–236
 - ontology for, 228–229
- TMPM4 (topicmaps.net Processing Model)
 - nodes in, 57
 - replacement of, 57
- TMQL (Topic Map Query Language), user requirements for, 63
- t-nodes (in topic nodes), 29
- in TMPM4, 57
- topic(s), 84–85
 - and aboutness, in knowledge organization, 434
 - in concept map, 4, 4*f*
 - creation of, 67, 158–165
 - in Nexist, 256, 257*f*
 - in SemanText, 204–207, 206*f*
 - CTW generated from, 174
 - definition of, 18, 539
 - in early drafts of ISO 13250 standard, 38
 - empty, 98–99
 - enumeration of, in TM4J, 216
 - ID generation for, in TM4J, 216
 - implicit, creation of, in TM4J, 220–221
 - instances of
 - in several classes, 182, 188
 - in XSLT templates, 190
 - in knowledge organization use case, 426
 - in knowledge representation
 - example, 358
 - merging, with scopes, 20–21
 - processing of, merging in, 47
 - vs.* RDFS, 293
 - regular, *vs.* ontology, 360
 - representation of, in topic map applications, 47–48
 - resources as, 27–28
 - in STWOL, 176
 - as instance of several classes, 182
 - layout function of, 177
 - referential constraint on, 182
 - source code for, 180–181
 - for TMP3
 - creation of, 236–240
 - defining, 228, 229*f*
 - in topic map syntax, 39
 - in XTM, as instance of several classes, 188
- topic-base name association, definition of, 539
- topic characteristic(s). *See also* association(s); member; name(s); occurrences
 - definition of, 540
 - scope applied to, in TM4J, 224
- for Web page content and rendering, 171–173
- topic characteristic assignment
 - definition of, 540
 - occurrences example, 188–189
- topic classes, PSIs for, 361, 361*t*
- topic hierarchy, defining, in semantic networks, 338
- topic map(s), 17–18
 - vs.* API, 47
 - applications for (*See* topic map applications)
 - attitude 48–50
 - in bibliographic databases, 449–452, 450*f*, 451*f*
 - browsing, in SemanText, 204, 205*f*
 - changes to, automatic
 - detection of, through TM4J, 225–227
 - completeness of, 49
 - complexity of, 13
 - components of, 23–24
 - concept map as, 3–4, 4*f*, 442–443
 - content model of, 98–99
 - constraints on, 339–340
 - example of, 375–377
 - in constructivist learning, 13, 14–15
 - in corporate knowledge repositories, 443–444
 - creation of, 155–165, 164*f*
 - in Nexist, 256, 257*f*
 - in SemanText, 204–207, 206*f*
 - in TM4J, 215
 - vs.* databases, 17–18
 - definition of, 3, 540
 - drill-down (*See* drill-down topic maps)
 - in education, 12, 14–15, 519–521, 520*f* (*See also* IBIS)
 - element 98–99
 - elements of
 - HTML rendering of, 173, 173*t*
 - in TM4J APIs, 213–215

- topic map(s) (*cont.*)
- empty, 98–99
 - extensibility of, 292–293
 - extraction of information
 - from, 353
 - formal semantics in, 435–436
 - future of, 66, 449–452
 - in GooseWorks Toolkit,
 - 261–262
 - with IBIS, 523–525, 523*f*, 524*f*, 525*f*
 - and indexing views, 438
 - information and reality in,
 - 33
 - for information presentation,
 - 17
 - innovation of, 429–430
 - for knowledge bases, existing,
 - 171
 - for knowledge management,
 - 353–354
 - vs.* HTML editors, 170, 170*f*
 - and knowledge organization
 - future of, 449–452
 - impediments to adoption of,
 - 428–430
 - overlap between (KOxTM),
 - 384–385, 386–391
 - potential value of, 427–428
 - recurring challenges in,
 - 430–438
 - relation of, 386
 - uses of, 439–447
 - vs.* knowledge organization systems, 428
 - knowledge organization systems exported to, 433, 441–442
 - for knowledge representation,
 - 507
 - as knowledge webs, 477
 - for life sciences, purpose of,
 - 149
 - limited deployment of,
 - 428–429
 - loading, in TM4J, 218–220
 - merging, 20–21
 - in SemanText, 207
 - merging in, and knowledge organization, 436–438
 - for MP3 collection (*See* TMP3)
 - neutrality of, 18, 25
 - in Nexist, as container,
 - 249–251
 - and ontologies, comparison of,
 - 125–126
 - ontology-driven (*See* ontology-driven topic map(s))
 - origins of, 17–18, 37–40, 65
 - perspectives for, 9
 - purpose of, 82
 - and RDF
 - combination of, 295–296
 - comparison of, 292–293, 294–295, 330
 - relation of, 18
 - ready-to-use, definition of,
 - 535
 - reification of, by root topic,
 - 174
 - in relational indexing, 434
 - and relevance, 434
 - representation in, of
 - incomplete knowledge, 431
 - saving, in TM4J, 221–223
 - and semantic networks, 293
 - comparison of, 330
 - in SemanText, 204
 - in semantic retrieval, 434
 - in Semantic Web, 2, 17–18, 511
 - and software applications,
 - independence from, 18
 - standards and specifications
 - for, 11
 - and SQL, for persistent storage, 250–251
 - subject-centric nature of, 43
 - for TMP3, extension of,
 - 243–244
 - use cases for, knowledge organization as, 424–438
 - usefulness of, 3
 - uses of, 268
 - validation in, in semantic networks, 340
 - view construction for, 4–5
 - visualization of (*See* visualization)
 - for Web navigation, 23, 171
 - Web site references for, 7
 - and XSLT, benefits of, 167
- topic map applications
- from GooseWorks, 261
 - topics represented in, 47–48
- topic map concepts, expression of, in ISO 13250, 26
- Topic Map Constraint Language (TMCL)
- development of, 340
 - user requirements for,
 - 63–64
- TopicMapObject interface, of TM4J, 214–215
- topic map objects, creation of, in TM4J, 215
- topic map paradigm
- definition of, 541
 - evolution of, 65
 - future of, 66
 - philosophy inherent in,
 - 48–50
- Topic Map Query Language (TMQL), user requirements for, 63
- topic map schema, in knowledge representation, 359–360
- topicmaps.net Processing Model (TMPM4)
- nodes in, 57
 - replacement of, 57
- topic map software, 64–65
- open source, 13
 - proliferation of, 51, 52*f*
 - Web site references for, 9
- TopicMaps.Org, 39–40, 51, 52*f*, 53

- topic map templates
 definition of, 541
 in knowledge representation, 359, 360–362
- TopicMap topic, construction of in CTW, 158, 159*f*
- Topic Navigator (Mondeca), 270, 272*f*, 519, 520*f*
- topic-occurrence association, definition of, 542
- topicRef, 27
 for explicit referencing, 28
 in member elements, 89–90, 89*n*
 in scope, 87–88
 for subject identification, 86–87
- topic-subjectIndicator assertion type, 58
- topic types
 definition of, 542
 filtering for, 195
 semantics of, in XTM specification, 25
 in XSLT templates, 177
 querying, 188–190
- TouchGraph, 202–203, 202*f*
- transitive relationships
 in knowledge representation, 365
 PSIs for, 365*t*
 in semantic networks, 328, 337
- Translator modules, in TMP3, 230
- tree visualization, 271–275
- trust
 building, for PSIs, 76
 in PSIs, 75
- type. *See* class
- type hierarchies, in semantic networks, 334–339
- U**
- UML (Unified Modeling Language), 62
- UMLS (Unified Medical Language System), project, reuse of, in ontology-driven topic maps, 130
- unconstrained scope
 in CTW implementation, 174
 definition of, 542
 in TM4J, 224–225
- unification, in logic programming, 118
- Uniform Resource Indicators (URIs)
 in Nexist, 259, 259*f*
 in XTM addressing, 25, 54
- Universal Interactive Visualization Tool (UNIVIT), 270, 273*f*
- universal knowledge organization systems, 401–402
vs. domains, 431–432
 for internet resources, 417–419
- universe of discourse, defining, for ontologies, 127
- University of Maryland, PARKA, 111
- UNIVIT (Universal Interactive Visualization Tool), 270, 273*f*
- unstructured information
 definition of, 104*n*
vs. structured information, 34
- URIs (Uniform Resource Indicators)
 in Nexist, 259, 259*f*
 in XTM addressing, 25, 54
- V**
- validation, in topic maps, in semantic networks, 340
- values, in RDF, 285–286
- variant element type, 97–98
- variant names (XTM), 20, 97–98
 in CTW generation, 169
 definition of, 98, 542
vs. display name/sort name, 27, 54
 nesting of, 27
- varlink, *vs.* xlink, 27
- view, construction of, for XTM document, 4–5, 7
- views-based indexing, 423–424
 in knowledge organization, 408
- virtual cities, for visualizations, 279–280, 280*f*, 281*f*
- virtual reality, for visualization, 279, 279*f*
- viruses, classification of, 154–155
- visual(s), dynamic, language transmitted through, 480
- visual data-mining tools, for visualization, 278–280
- visualization
 current, 270
 graphs and trees for, 271–275
 hyperbolic geometry for, 273, 274*f*
 maps for, 275–278
 navigation requirement for, 268, 269–270
 in graphs and trees, 273–275
 in virtual worlds, 280
 representation requirement for, 268–269
 in graphs and trees, 271–273
 in maps, 275–278
 in virtual worlds, 279–280
 usefulness of, 267
 virtual reality for, 279, 279*f*
 visual data-mining tools for, 278–280
- vocabulary, as ontology, 125, 126*f*
- W**
- Warren Abstract Machine (WAM), 118
- Web browsers, use of, 103
- Web navigation
 metadata for, 22–23
 topic maps for, 23, 171

- Web portal
 maintenance of, 167
 topic maps for, 445–446
- WebSGML, correspondence to XML, 35
- Web site
 CTW-based
 design of, 169, 172–173
 maintenance of, 168–169
 merging of, 174
 source code for, 177–178, 179*f*
 definition of, 167
 maintenance of, HTML editors *vs.* topic maps for, 170, 170*f*
 ontology of, design of, 171
 sitemap for, control of, with association, 195–196
 source code for, XTM as, 171–173
- Web site references
 for topic map, general, 8
 for topic map software, 9
 updating of, xxii
- weightings, in *SemanText*, 210
- Weinberger, David, on the Web, nature of, 1
- Whataburger model for topic maps, 38
- Whittaker, R. H., 151
- Wiki Web sites, 68
- World Wide Web. *See also* Web
 design of, by Tim Berners-Lee, 39
 finding information on, 41
 formal languages in, 35*n*
 information on, from relational databases, 106
 logic and constraint programming on, 119
 meanings shared on, 507, 509–510
 ontological engineering applications and, 124
 purpose of, 507
 semantic communication and, revolution in (*See* Semantic Web)
 as social realm, 1
- World Wide Web Consortium, web address of, 35*n*
- writing
 language transmitted through, 479
 paradigm shift in, 498
- X**
- xinclude:include, 193–194
- xlink, in XTM specification, 27, 54
- xlink:href attribute
 constraint imposed by, in STWOL, 181
 function of, 85
- XML (eXtensible Markup Language)
 angle brackets used in, 81
 content-based tagging in, 353
 elements in, 81
 formatting conventions for, 15
 function of, 22
 and HTML, transformation into, 7 (*See also* XTM document, and Web pages)
 with IBIS, 523–525
 ontological extensions to, 124
 for ontologies, 120–121
 in RDF, 285, 288–291
 namespaces in, 288–290, 289*f*, 290*f*
 for relational databases, 46
 semantic extensions to, 124
 and semantic interoperability, 388
 syntax of, 39
 topic maps built from parsing, 206–207, 208*f*
 WebSGML in, 35
- XML InfoSet, 46*n*, 62
- xml declaration line, in topic maps, 98
- XML Ontology Exchange Language (XOL), 120, 124
- XML topic map specification. *See* XTM specification
- XSLT layers in CTW, 182–183
- XSLT style sheets in CTW
 back-end layer of, 182
 HTML from, 184
 topic-specific, 184–186, 187*f*
 layout layer of, 182–187
 namespace declaration in, 186–187
 presentation layer of, 182
- XSLT technology
 and topic maps, benefits of, 167
 uses of, 168
 for XML to HTML transformation, 7
- XSLT templates in CTW, 183–184
 for occurrences, 192–193
 topic instances determined by, 190
 topic-specific, 184–186, 187*f*
 topic types for, 177
 querying, 188–190
- XTM Authoring Group, xxii, 26
- XTM document
 of concept map, 5–7
 view for, 7
 and Web pages, transformation into, 13 (*See also* XML, and HTML)
- XTM elements, number of, 83
- XTM engine
 as API, for knowledge management, 252
 in *Nexist*, 251–254, 252*f*, 253*f*
- XTM framework. *See* CTW (Creative Topic Map Websites) framework
- XTM specification
 addressing in, 25–26
 conceptual model for, 26

- constructs for, documenta-
tion for, in syntax
layer, 62
 - creation of, 39–40
 - design of, 23–25
 - DTD for, 26, 55
 - element types in, 27
 - evolution of, xxii
 - facets and, lack of, 29
 - future of, 66
 - history of, 10, 23, 24*f*, 53
 - vs.* ISO 13250, 53–54
 - markup of, *vs.* RDF, 297
 - in Nexist, use cases for, 248
 - ontologies coded with,
127–128
 - ontology-driven topic maps in,
129–130
 - philosophical perspective of,
10–11
 - processing model for, 29
 - published subjects in, 29
 - purpose of, 39
 - and RDF, 14
 - referencing in, explicit,
28–29
 - reification in, of topics, 27–28
 - release of, 53–54
 - semantics in, 25
 - support for, in SemanText,
204, 209
 - variant names in, 27
 - varlinks in, 27
 - XTM technology, conception
of, xxii
- Y**
- Yahoo, topical organization
of, 41

Also Available from Addison-Wesley



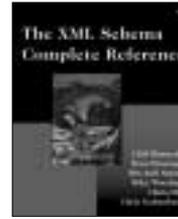
0-201-74852-5



0-201-73063-4



0-201-65796-1



0-672-32374-5



0-201-70914-7



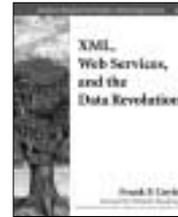
0-201-67487-4



0-201-77059-8



0-201-70915-5



0-201-77641-3



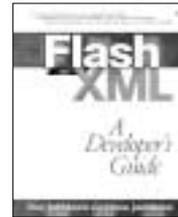
0-201-77006-7



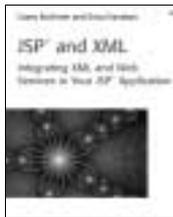
0-201-75605-6



0-201-71103-6



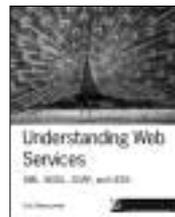
0-201-72920-2



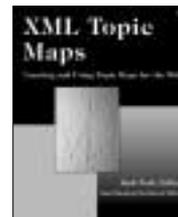
0-672-32354-0



0-201-77004-0



0-201-75081-3



0-201-74960-2



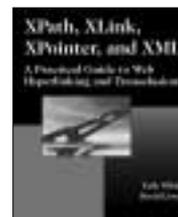
0-201-70359-9



0-201-65764-3



0-201-74095-8



0-201-70344-0

Articles

Books

Free Library

Expert Q&A

Training

News

Downloads

OPERATING SYSTEMS

WEB DEVELOPMENT

PROGRAMMING

NETWORKING

CERTIFICATION

AND MORE...

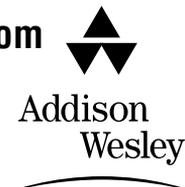
**Expert Access.
Free Content.**

Solutions from experts you know and trust.

- ✓ Free, indepth articles and supplements
- ✓ Master the skills you need, when you need them
- ✓ Choose from industry leading books, ebooks, and training products
- ✓ Achieve industry certification and advance your career
- ✓ Get answers when you need them from live experts or InformIT's comprehensive library



Visit **InformIT**
and get great content
from





Register Your Book

at www.aw.com/cseng/register

You may be eligible to receive:

- Advance notice of forthcoming editions of the book
- Related book recommendations
- Chapter excerpts and supplements of forthcoming titles
- Information about special contests and promotions throughout the year
- Notices and reminders about author appearances, tradeshows, and online chats with special guests

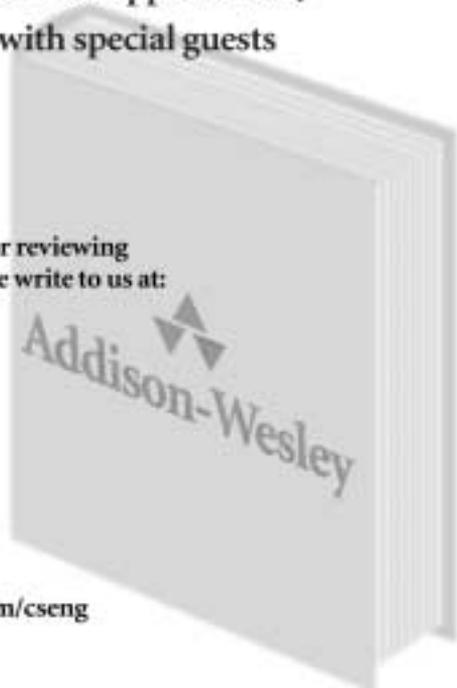


Contact us

If you are interested in writing a book or reviewing manuscripts prior to publication, please write to us at:

Editorial Department
Addison-Wesley Professional
75 Arlington Street, Suite 300
Boston, MA 02116 USA
Email: AWPro@aw.com

Visit us on the Web: <http://www.aw.com/cseng>



Addison-Wesley