

Index

A

active schema language (ASL) 172, 173
 active tags 151
 active tags, the next generation of XML-based systems 159
 adaptation, document 76, 84
 adaptive approaches, overview of 13
 adaptive hypermedia 203
 adaptive query processing, of XML streams 194
 Adjustable and Adaptable Method 16
 advanced security facilities 276, 282
 algebraic rewriting 99
 algorithm, to reduce translation time 115
 algorithms, non-blocking or progressive 183
 ancestor-descendant (A-D) 185
 ancestor-descendant (AD) 191
 ancestor-descendant relationship, tree nodes 211
 annotations, multi-faceted property 203
 annotations, of nodes with an ancestor-descendant relationship 226
 annotations, Semantic 205, 225
 annotation scheme, in XML documents 225
 Ant 154
 application-level benchmark 315, 317
 application programming interfaces (APIs) 272
 application types 6
 approximate XML query processing 194
 ArHeX 281
 atom feeds 182
 attribute diversity 35

attribute hierarchy, as an XML element 299
 automaton-associated rewriting 100
 Automed 274
 Automed, 4-step approach 274

B

backward compatibility
 70, 72, 73, 74, 75, 83
 BEA/XQRL 97
 benchmarking projects, for XML data management systems and query engines 313
 benchmarking projects, for XML parsers and validators 312
 benchmark repository 317
 benchmarks, family of 316
 benchmarks, general requirements for 321
 B Fabric 275
 bio-molecular entities, XML representation of 266
 bio-molecules and bio-molecular data types 265
 bioinformatic sequence markup language (BSML) 266
 biological data, integration of 272, 273
 biological data types, XML representation of 266
 biological expressions, XML representation of 267
 BioPAX (Biological Pathways Exchange Language) 278
 BUFF – Bottom-Up Filtering FSM 142
 business artifacts, conceptual design 36
 business artifacts, logical design 39

C

CDuce program 159
cell markup language (CellML) 269
character large object (CLOB) 4, 29
class, attribute hierarchy 293
class, complex multidimensional 295
class, complex multidimensional schema 295
class, complex relationship 293
class, object hierarchy 294
combining solutions 217
commercial off-the-shelf (COTS) 2
complex aggregations 291
complex attribute hierarchy 293
complex cube 296
complex cube, described by an XML schema 301
complex data, as dimensions 290
complex data, as facts 290
complex hierarchies 303
complex multidimensional schema 295, 296
complex multidimensional schema class 301
complex object 291
complex object, using XML schema 298
complex object hierarchy 294
complex relationship 292
complex relationship, using XML schema 298
conceptual design 29, 36
conceptual model 30, 37, 43, 291
conceptual XM (C-XML) 42
condensed-RSA digital signature scheme 242
containment constraint 217
content-based dissemination services 146
content-based routing systems 140
content-based routing systems, scenarios and applications 140
content model 172, 174, 175
continuous query language (CQL) 185
cost-based optimization 99
cost-driven techniques 14
cPATH 279

D

data, evolution of 275
data, explicit and Semantically-rich relationships between 291
data-centric/multiple documents (DC/MD) 316

data-centric/single document (DC/SD) 316
data access, XML technologies and 272
data and application evolution systems 276, 280
database (DB) 234
database management systems (DBMS) 191
database outsourcing models, two kinds 232
data characteristics, theoretic study of 323
data confidentiality 231, 235, 256
data confidentiality, ensuring 239
data confidentiality-user privacy (DC-UP) 237
data confidentiality-user privacy-data privacy (DC-UP-DP) 237
data definition language (DDL) 30
data generator, more sophisticated 321
data model representation of XML (XDM) 152
data preparation 288
data privacy 231, 235, 256
data privacy, ensuring 240
data security 275
data stream applications 188
data structure complexity, preserving 303
data versioning 40
data warehouse data exchange 289
data warehouse data storage 289
data warehouse modeling 289
data warehouses 287, 288
DAWAX system 289
DB2 Version 9.5 71
DC-UP (data confidentiality-user privacy) 237
DC-UP-DP (data confidentiality-user privacy-data privacy) 237
decomposition to relations 5
deoxyribonucleic acid (DNA) 265
derivative trading community 35
deterministic automata (DFA) 93
deterministic finite automata (DFA) 193
deterministic finite state automaton (DFA) 76
Dewey decimal classification 18
differently distributed collections, evaluation on 223
Digital Bibliography & Library Project (DBLP) 288
dimension, symmetric and simultaneous facts and 291
directed acyclic graph (DAG) 188

direct mapping 17
 directory enabled networks (DEN) 53, 61
 directory information tree (DIT) 54
 directory services markup language (DSML) 56
 distinguished name (DN) 54
 document adaptation, and population 81
 document representation 208
 document type definition (DTD) 34, 142
 document validation 69
 dynamic declarative languages, novel issues with 176

E

e-catalogs 34
 e-government services 202
 early Pub/Sub systems 141
 EDI (electronic data interchange) 233
 efficiency 275
 electronic data interchange (EDI) 233
 element nodes, transforming other XML nodes into 114
 entity-relationship (ER) 30
 entity-relationship model (ER) 30
 event-driven parsers 312
 evolution primitives 75, 79
 existing query benchmarks 320
 explicit hierarchies 303
 explicit relationships 303
 extended entity relationship (EER) 42
 extensible markup language (XML) 2, 62, 181, 233
 extensible stylesheet language (XSL) 109
 extraction operation 6
 extra small (XS) 317

F

fact and dimensions, simultaneous treatment of data as 303
 facts and dimensions, symmetric treatment of 303
 financial products markup language (FpML) 35
 flexible retrieval systems, for heterogeneous sources 280

FlexMap 16
 FluXQuery 189
 FluX query language 190
 FLWOR 159
 FLWR (For-Let-Where-Return) 185
 fourth normal form (4NF) schema decomposition 12
 fragment-based input streams 91

G

generalized nested loops (GNL) 190
 GeneX project 267
 grid-based systems 276
 grid architectures 281
 Gryphon 145

H

handling intermediate results, and function calls 115
 handling intermediate results, differences in 112
 hardware-based approaches 252
 health care industry 36
 Helmholtz Open Bioinformatics Technology (HOBIT) 267
 heterogeneity 298
 heterogeneity conflicts, three levels of 272
 heuristics 188
 HOBIT (Helmholtz Open Bioinformatics Technology) 267
 HOBIT XML formats 267
 holistic technology for the slice operator, Semantic aspects 218
 holistic technology for the slice operator, temporal aspects 214
 housing-based database outsourcing model 232
 Human Proteome Organization (HUPO) 277
 HUPO-PSI-MI (Proteomics Standards Initiative formats) 277
 hybrid database design 36
 hybrid tree-based approaches 253
 hybrid XML-relational database 29
 hybrid XML-relational model 29
 hyperschemas 176

I

IBM DB2 9, 42
index-driven integration 275
indexing scheme extensions towards, multi-version management 213
indirect mapping 18
input data formats, for XML streams 91
in silico experiments 273
instance, attribute hierarchy 293
instance, complex object 292
instance, complex relationship 293
instance, object hierarchy 294
instance, relationship 293
instances, attribute hierarchy 292
instances, of class 292
insurance industry 140
integration design patterns 4
integration of data, basic notions 272
Internet Engineering Task Force (IETF) 61
interval encoding 18

J

JavaServer Pages (JSP) 155
Jelly 157

K

key, foreign key and ordinal strategy (KFO) 18
key discovery process, for XML data 275

L

language constructs, differences in 113
LDAP-XML integration, implementations and tools 59
LDAP framework, storage and retrieval basics 53
learning management systems (LMSs) 59
lightweight directory access protocol (LDAP) 53, 61
list 187
location-based services (LBS) 140
logical design 30, 38
logical model 39, 297

M

macro 152, 158, 164, 165, 167
Mapping Definition Framework 17
massively multi-query join processing (MMQJP) 191
match node sets approach 119
MemBeR:XQuery Micro-Benchmark Repository 317
MGED Ontology 267
Michigan Benchmark (MBench) 315
micro-benchmark 315, 317
MicroArray Gene Expression (MAGE) project 267
MicroArray Gene Expression Data (MGED) 267
Microsoft SQL Server 10, 42
Minimum Information About a Microarray Experiment (MIAME) 267
MMS model (multiple data owner-multiple clients-service provider) 239
modeling, issues and requirements 290
MS model (multiple data owner-service provider) 238
multi-party computation (MPC) 249
multi-similarity systems 276
multi-user benchmark 314
multi-version document slicing 206
multiple-candidate approaches 15
myGRID 282

N

native vs. stratum comparison 223
native XML databases 51
native XML languages without XML 159
native XML programming 151
native XML programming systems, characteristics of 157
nested B+-Tree (NBT) 254
nested Merkle B+-tree 253
node-based XML document, transformation 253
node identifier insertion approach 114
non-deterministic automata (NFA) 93
non-empty intersection constraint 215
non-text-derivative types, handling 168

nondeterministic finite automaton (NFA) 193
 non XML-based files 264
 NT file system (NTFS) 220

O

object-model parsers 312
 object-oriented databases (OODBs) 50
 object-relational databases (ORDBs) 50
 object hierarchy, as an XML element 300
 object role modeling (ORM) 42
 objects, storing in XML attributes 169
 ODBS 234
 ODBS model, security-related research questions in the 235
 ODBS model, security issues in and outsourced XML databases 235
 ODBS models, overview of existing solutions to 239
 online analytical processing (OLAP) 290
 ontologies, definition 201
 ontology-based files 264
 ontology-based systems 276
 ontology-like efforts 276
 ontology Web language (OWL) 264
 Onyx (operator network using YFilter for XML) 193
 Open Biological Ontologies (OBO) foundry 276
 open biomedical ontology (OBO) 264
 operator network using YFilter for XML (ONYX) 193
 Oracle XML DB 10
 outsourced database service (ODBS) model 233
 outsourced tree-indexed/XML data, query assurances for 248
 outsourced XML databases, security issues in 233
 outsourced XML database service model 231
 outsourced XML data trees, oblivious basic operations on 247
 OXMLDBS 234, 245
 OXMLDBS models 233, 249
 OXMLDBS models, state-of-the-art approaches to security issues in 244

P

parameters, simulating the use of 126
 parent-child (PC) 191
 parent-child relationship, tree nodes 211
 parsing 320
 Pathway Commons 279
 peer-to-peer (P2P) networks 145
 Pegasys 273
 personalization 201, 203, 206
 personalization, defined 204
 personalization, in multi-version documents 209
 personalization, of XML documents 205
 personalization, techniques 202
 personalization queries 199, 202, 225
 personalization query 210
 physical design 30
 pipelines 152, 158
 position-based indexing scheme 211
 POX 143
 privacy concerns 235
 processing instruction (PI) 153
 processing models 6
 progressive XML query processing 181
 progressive XML query processing algorithms, building blocks of 187
 proof of completeness 236
 proof of correctness 235
 proof of freshness 236
 Protein Standard Initiative (PSI) 277
 proteomics standards initiative (HUPO-PSI) 269
 ProXML 267
 pull-parsers 312
 push-parsers 312
 pushdown automation (PDA) 188
 pushdown transducer (PDT) 188

Q

quality of service (QoS) 61
 query assurance 231, 235, 257
 query assurance, ensuring 242
 query execution models 92
 query generator 323
 querying 320

querying operation 6
query processing 186

R

R-Sox 190
rate-based progressive algorithm (RPJ) 188
RDBMS technologies 3
really simple syndication (RSS) 182
reference collection (C-ref) 220
relational data 146
relational database management systems (RDBMSs) 7, 29
relational databases 1, 5
relational databases (RDBs) 49
relational databases, XML data management in 1
Relational Model 30
relational schema 5, 12
relational schema, logical mapping from an XML schema 20
result rate-based progressive algorithm (RRPJ) 188
revalidation, document 67, 68, 70, 76, 77
reverse pattern approach 123
ribonucleic acid (RNA) 265
RNAML 267
Roadmap 90, 311
RoXSum 143
RSS (really simple syndication) 182
RSS feeds 140
runnable declarative languages, the dynamic method and its novel issues 173
runtime library 127
runtime schema change 103
runtime schema information (RSI) 190

S

Sarbanes Oxley Act 28
scalability 223
schema-based optimization 101
schema annotations 18, 22
schema evolution 67, 69, 70, 72, 75, 76, 77, 79, 84
schema evolution, and Tamino 74
schema evolution, conceptual design 38
schema evolution, copy-based 73

schema evolution, in-place 73
schema evolution, in XML DBMSS 70
schema evolution, logical design 39
schema evolution, two kinds of 73
schema generator 322
schema languages, and their issues 173
schema modification 67, 69, 70, 72, 74, 78, 79, 81, 84
schema modification, and evolution primitive 79
schema shredding 21
Schematron 175
schema variability, conceptual design 37
schema variability, logical design 39
schema versioning 67, 70, 72, 74, 75, 85
SCXML 156
search tree, oblivious operations on outsourced 246
secure and efficient storage 237, 257
secure and efficient storage, ensuring 243
secure and efficient storage model 231
secure auditing 231, 236, 257
secure auditing, ensuring 243
secure multi-party computation-based approaches 249
Semantically rich relationships 303
Semantic annotation dimension, added to time-stamps 205
Semantic data types, designing 170
Semantic query optimization (SQO) 101, 190
Semantic query optimization (SQO), applicable to both persistent and streaming XML 101
semi-OXMLDBS model 244, 245
semi-structured data 7
Shareable Content Object Reference Model (SCORM). 58
Siena 145
single-candidate approaches 14
slice operator 209
slice operator, holistic technology for the temporal aspects 214
slicing 202
sliding window 185, 186, 194
SMS model (single data owner-multiple clients-service provider) 238

SQL/XML 8
 SQL Server 2008 71
 SQO, specific for streaming XML 102
 SS model (single user-service provider) 238
 state-of-the-art perspective 1
 state-of-the-art perspectives 11
 state-of-the-practice 1
 state-of-the-practice perspectives 7
 state-of-the-practice solutions 7
 state of the art review 141
 statistics collection 101
 StatiX 16
 structural relationships, between tree nodes 211
 subsumption algorithm, for XML 275
 SWAMI 274
 synopsis data 194
 synopsis data structures, for continuous XML data 194
 system, able to connect to various data sources 165
 system, with A template engine 163
 system, with tag-based scripting languages 160
 system, with tag libraries 161
 system, with XML pipeline facilities 164
 system biology, XML representation of 269

T

Tamino 74
 temporal window, changing the selectivity of the 222
 test suite 312
 text-centric/multiple documents (TC/MD) 316
 text-centric/single document (TC/SD) 316
 textual information 146
 timestamps 205
 token-based input streams 91
 ToXgene data generator 316
 ToXgene generator 323
 Transaction Processing over XML (TPoX) 317
 translation, from XQuery expressions into XSLT stylesheets 114
 translation process 127
 tree-based index structures 244
 tree-inner structure, of multi-version XML documents 207

trusted third party-based approaches 251
 tuple 190, 194
 tuple-based windows 185
 TurboXPath 190
 Twig'n Join (TnJ) 191
 TwigM machine 190
 twig patterns 186
 twig queries 186
 twig query 200
 TwigStack algorithm 186
 TwigStackList algorithm 187

U

unified expression language (UEL) 152
 unified modeling language (UML) 30
 untrusted server 235, 244, 246, 247
 updating operations 6
 use case 313, 314, 316, 321
 user-designed structure, XML data 210
 user's remote database access-based classification 237
 user driven techniques 16
 user privacy 231, 235, 256
 user privacy, ensuring 240

V

VA-RoXSum 143
 validating 320
 vectorization 255
 vendor solutions 9
 versioned, XML documents 200
 versioning, in XML DBMSS 70
 versioning, Semantic 200
 versioning, temporal 200
 virtual organization (VO) 281
 virtual private networks (VPNs) 61
 voice over IP (VoIP) 53

W

W3C datatypes 167
 W3C XML query use cases 316
 W3C XML Query Working Group 313
 work array (WA) 190
 World Wide Web Consortium (W3C) 109

X

- X-Evolution 78
- X007 benchmark 314
- XBench 316
- XCachedB system 18
- XDM, compatibility with 170
- XMark 313, 321
- XML (extensible markup language) 181, 233
- XML, and directory services 53
- XML, and XML data streams 184
- XML, and XML schema in DBMSs 69
- XML, documents and schemas 67
- XML, instructions to process 153
- XML, non-temporal multidimensional 203
- XML, retrieval policies 51
- XML, storage policies 49
- XML, two categories of 151
- XML-based files 264
- XML-enabled databases 49
- XML-to-relational mapping 3, 11, 12, 13, 15, 16, 17, 18
- XML-wrapped database systems 35
- XML and LDAP, integration of technologies for Data storage and retrieval 56
- XML bazaar, more 154
- XML benchmarking 309
- XML benchmarking, existing approaches and their classifications 311
- XML benchmarking projects, other 319
- XML conformance test suites 312
- XML control language (XCL) 160
- XML data 310
- XML data, OLAP on 290
- XML database, four steps for designing from scratch 30
- XML database design 30
- XML data collections 310
- XML data management benchmark (XMach-1) 314
- XML data model 151, 153, 177, 203
- XML datasets 311
- XML data streams 181
- XML document, multi-version 201
- XML documents 110
- XML documents, authentic publication of 244
- XML documents, constructed from Shakespeare's plays 313
- XML documents, efficient personalized access to multi-version 205
- XML documents and schemas 145
- XML documents management, research work 202
- XML document type definitions (DTDs) 264
- XML enabled directory (XED) 61, 62
- XML exchange standard 35
- XML languages 152
- XML normal forms (XNF) 42
- XML packet 141
- XML parsers, performance evaluation of 312
- XML programming, advantages of 152
- XML programming issues 153
- XML querying (XQuery) 152
- XML query languages 290
- XML query processing, progressive 188
- XML query processor, foundations of native 210
- XML query processor, native multi-version 206
- XML query use cases 313
- XML routing systems 141
- XML Schema 11, 34
- XML schema 5, 14, 17, 290
- XML schema, definitions 13
- XML schema, evolution approaches 75
- XML schema, evolution primitives 75
- XML schema, information provided for document 68
- XML schema, language 13
- XML schema, logical mapping to a relational schema 20
- XML schema, purposes 69
- XML schema, three categories of changes between revisions 75
- XML schema, versioning issues 83
- XML schema definition (XSD) 315, 264
- XML schema evolution, document adaptation 76
- XML schema evolution, incremental validation 76
- XML Schema language 323
- XML schema versioning, issues 83

- XML stream 142
 - XML stream machine (XSM) 188
 - XML stream processing, out-of-order handling in 98
 - XML stream processing, query optimization for 99
 - XML stream processing, some open challenges in 103
 - XML stream processing, using automaton in 92, 104
 - XML streams, access control in 104
 - XML streams, data spilling in 104
 - XML streams, load shedding in 103
 - XML switch 141
 - XML technologies, and data access 272
 - XML technologies, the need to combine 154
 - XML type system, advanced 167
 - XML version of the LDAP protocol (XLDAP) 61
 - XPath 92, 93, 97, 98, 181
 - XPath-based framework 151
 - XPath-based pattern 111
 - XPathMark 316
 - XPath predicates 317
 - XPath query 185
 - XPath query language 320
 - XProc 156
 - XQuery 8, 93, 94, 97, 98, 182
 - XQuery, four constructs of 317
 - XQuery, translating to XSLT 108
 - XQuery and XSLT, background of translations between 128
 - XQuery expression, translation of an 118
 - XQuery expressions, translation into XSLT stylesheets 109
 - XQuery FLWORs 317
 - XQuery language 108, 320
 - XQuery node constructions 317
 - XQuery queries 181
 - XQuery query 185
 - XQuery Update 69
 - XSchemaUpdate Language 82
 - XSD (XML schema definition) 315
 - XSLT, template model of 112
 - XSLT and XQuery 110
 - XSLT and XQuery, common issues of 129
 - XSLT and XQuery, differences of 111
 - XSLT and XQuery, similarities of 111
 - XSL transformations (XSLT) 109
 - XSLT stylesheet, processing of the translated 118
 - XSLT stylesheets, translation from to XQuery expressions 119
 - XSLT stylesheets, translation into XQuery expressions 109
 - XSQ system 188
 - XTreeNet 143
 - Xylème project 289
- Y**
- YFilter 142