Symbols

.NET 307, 309

Numerics

4+1 view model 655, 656

A

abstract class 260, 520
in UML 250, 260
abstract conceptual class 519
Abstract Factory 597
abstract operation 260
in UML 250, 260
abstract use case 497
action 477
activation bar 228
active class 239, 269
active object 239, 269, 584
activity diagram 477, 478
actor 63, 80
in use case 66
offstage 66
primary 66
supporting 66
Adapter 436
adaptive development 21
adaptive vs. predictive planning 674
addition use case 497
aggregation 264
agile methods 17, 27, 28, 326, 673
agile modeling 14, 30
agile UP 31
analysis 6
analysis and design
definition 6
analysis object models 134
architectural
analysis 543, 544
deployment 543, 544
baseline 128
debate 544
design principles 553
decision 544
factors 544
factors-promotion of 555
proof-of-concept 557, 669
prototype 128
synthesis 557, 669
view

INDEX

deployment 658
implementation 658
logical 657
process 658
security 658
use case 659
architectural approach documents 550
architectural factors 545
architectural view 656
architecturally significant requirements 545
architecture 200, 559
cross-cutting concerns 554
documenting 655
factor table 546
issue cards 550
layered 202
logical 197
separation of concerns 554
technical memos 550
artifact
UML deployment diagrams 623
artifacts 34
organizing 680
ASP.NET 307
aspect-oriented programming 555
association 150
criteria for useful 150
decision 255
finding with list 155
for UML properties 252
link 240
multiple between types 155
multiplicity 153
naming 152
qualified 531
reflective 532
role names 528
UML notation 151
association class 266, 523
asynchronous message 588
in communication diagrams 246
in sequence diagrams 238
attribute 158
and quantities 165
data type 162
derived 160, 530
for UML properties 252
in UML 250
no foreign keys 165
non-primitive types 163
UML notation 159
valid types 160

view
data 658
### INDEX

**B**
- base use case 497
- behavioral decomposition 424
- benefits of iterative development 22
- black-box use cases 81
- Booch Method 194
- boundary objects 307
- brief use case 66
- Business Modeling discipline 34, 483
- Business Object Model 134, 484
- business rules 117
- Business Rules artifact 58, 102
- business use case 73

**C**
- CASE tools 398
- casual use case 66
- Change Cases 432
- class
  - abstract 520
  - association 523
  - conceptual 14, 136
  - conceptual & abstract 519
  - definitions 13
  - design 14
  - hierarchy 404, 510, 522
  - implementation 14
  - in UML 226, 250
  - mapping from DCD 371
  - partition 514
  - partitioning 514
  - software 14
  - UML meaning 13
  - UML notation 226
- class diagram 133, 249, 250
- class diagrams 249
- class hierarchy 404, 510
- class method calls 236, 245
- class operation
  - in UML 250
- classifier 14
  - in the UML 251
- classifier name
  - in UML 250
- client-driven development 27
- COCOMO II 180
- code
  - mapping OO designs 369
  - code smells 390
  - cohesion 290, 314
  - collaboration
    - in RDD 277
  - collaboration diagram
    - conditional messages 243
- example 224, 225
- instance creation 241
- iteration 244
- links 240
- message sequencing 242
- message to self 241
- messages 240
- mutually exclusive conditionals 244
- sequence number 242
- collaborations
  - of objects in RDD 276
- collection
  - in OO programming 374
  - in UML 250
- iteration over in UML 233
- n UML 245
- Command pattern 610, 645
- Command-Query Separation Principle 358
- comment
  - in UML 256
  - communication diagram 223
  - iteration over a collection 245
  - message to class object 245
  - strength and weaknesses 223
  - communication path
    - in deployment diagram 623
- compartments
  - in class box 251
  - in class diagrams 268
- component 624
- component diagram 623
- component-based modeling 623
- Composite 452
- composite aggregation 264, 282, 525
- composition 264, 293, 525
- concept
  - extension 136
  - finding with noun identification 141
  - intension 136
  - mistake while finding 146
  - specification or description concepts 147
  - symbol 136
  - versus role 529
- conceptual class 14, 136
- abstract 519
- conceptual model 8, 134
- conceptual object model 9
- Concrete Factory 440
- concrete use case 81, 497
- conditional messages in sequence diagrams 231
- constraint
  - in note symbols 256
  - in UML 265
  - UML 192
- construction phase 33
- constructors
  - in UML 250
- container (in Decorator pattern) 555
INDEX

data dictionary 58, 115
data flow diagrams 479
data holder objects 571
data model 136, 629
data modeling 629
data type 161, 162, 254
data view 658
Database Broker pattern 632
Database Mapper pattern 632
database mapping 625
data-driven design 442
datastore node 480
decision symbol 481
activity diagrams 481
delegate 287
delegation 287
Delegation Event Model 463
dependency 201, 260
deployment architecture 199
deployment diagram 621
deployment view 658
derived attributes 160
description class 147
design 7
Design by Contract 194
design class 14
design class diagram 10, 251
Design discipline 34
Development Case 37
device node 622
diagram fragment 230
diagram frames 230
discipline 34
and phases 35
Do It Myself 297, 600
documenting architecture 655
domain layer 136, 206, 282, 287
Domain Model 134
domain vocabulary 134
finding concepts 139
map-maker strategy 145
modeling changing states 521
modeling the unreal 146
multiple meanings 136
organizing in packages 533
domain model 131
domain object models 134
domain objects 136, 206, 287
domain rules 58, 117

E
eager initialization 444
EBP 88
Eclipse 387
EJBs 387
in Controller pattern 308
elaboration phase 33, 123, 127
elementary business process 73, 88
entity objects 307
Environment discipline 34
error definition 586
essential use case style 80
estimates 678
estimation 180, 678
event 486
Evo 545
evolution point 432, 542, 552
evolutionary development 17, 18, 19
exceptions 588
in class diagrams 250, 256
exceptions in UML 588
executable architecture 128
execution environment node 622
execution specification 228
Expert 283, 294
application 332, 335, 336
extend use case relationship 497
extension 136
extension point 498
Extrem Programming 18, 40, 280

F
Facade 461
factor table 546
Factory 440
 INDEX

H

Hibernate 626
High Cohesion 314
Hollywood Principle 627

I

IDEs 387
implementation 34
implementation class 14
Implementation Model 369, 614, 658
implementation view 658
inception phase 33, 47, 126
include use case relationship 494
Indirection 426
Information Expert 283, 294
information hiding 433
inheritance 522
in UML 260
initial domain object 348
instance
in UML 623
UML notation 226
intension 136
interaction diagram 221, 222
class 226
instance 226
message syntax 226
interaction fragment 230
interaction frames 177, 230
interaction occurrence 235
interaction overview diagram 222, 235
interaction use 235
interface 192
in UML 250, 263
when to use 420
interface realization
interface implementation 263
issue cards 550
iteration over a collection in UML 245
Iteration Plan 32, 676
iterations 19
iterative development 17, 18, 19
benefits 22
planning 673
iterative lifecycle 19

J

JUnit 387

failure definition 586
fault definition 586
feature of system 112
features 58, 108, 112
final class
in UML 260
final operation
in UML 250, 260
fixture
in testing 387
focus of control 228
fork 477
formal specifications 193
forward engineering 398
found message 228
frames 230
opt, loop, alt, ref operators 230
framework 627
persistence 627
frameworks 625
fully dressed use case 67
function points 180
functional requirements 57
Fusion method 194

G

Gang of Four patterns 280, 436
generalization 260, 404, 510
abstract class notation 520
and conceptual class sets 512
and conceptual classes 511
conformance 512
in UML 260
overview 509
partitioning 514
subclass validity tests 513
UML notation 510
generalize
use case relationship 499
generics 267
Glossary artifact 58, 102, 115
GoF design patterns 280
GRASP patterns 271, 277, 321
Controller 302
Creator 291
Expert 294
High Cohesion 314
Indirection 426
Low Coupling 299
Polymorphism 414
Protected Variations 427
Pure Fabrication 421
guarded methods 250, 639

698
## INDEX

### K
- keyword in UML 258

### L
- Law of Demeter 430
- layer 199
- layered architecture 199, 202
- lazy initialization 444
- lazy materialization 647
- lifeline 227
- UML interaction diagrams 226
- link 240
- Liskov Substitution Principle 429
- logical 559
- logical architecture 197, 199, 559
- logical view 657
- lollipop notation 264
- looping sequence diagrams 177, 231
- Low Coupling 284, 299
- low representational gap 138, 281, 330
- lower representational gap 11
- LRG low representational gap 281, 330
- LSP 429

### M
- MDA 11, 12
- merge symbol activity diagrams 481
- message asynchronous 588
- UML notation 228, 240
- metaclass 236
- metadata 116, 633
- method 192, 257
  - from collaboration diagram 372
  - in note symbols 256
  - in UML 250
- Model Driven Architecture 11, 12
- Model-View Separation 209, 331
- Model-View-Controller 209, 307
- modular designs 317
- Moment-Interval 528
- multiplicity 153, 255
- MVC 209, 307

### N
- N+1 view model 655, 656
- namespace

### O
- object active 584
  - in UML 226
  - persistent 626
- Object Constraint Language 265
- object databases 626
- object design 7, 271, 321, 363
  - introduction 213
- object node 477
- object-oriented analysis 7
- object-oriented analysis and design
  - definition 7
- dice game example 8
- object-relational mapping 625
- Observer 463
- OCL 192, 265
- offstage actor 66
- Open-Closed Principle 434
- operation
  - in UML 250, 257
  - operation contracts 181
  - operations 192
  - ordered
    - keyword in UML 255
    - organizing artifacts 680

### P
- package dependencies 533
  - design 613
  - organization guidelines 614
  - ownership 533
- reference 533
- package attributes in UML 250
- package diagram 197, 199, 201
- package name
  - in UML classifier name 250
- parameterized types 267
- parameters
  - in class diagrams 256
- participants
  - in interaction diagrams 226
INDEX

partition 477
path name 564
pattern 4, 278, 279
Abstract Factory 597
Adapter 436
Command 610
Composite 452
Controller 302
Convert Exceptions 587
Creator 291
Do It Myself 297, 414, 600
Expert 294
Facade 461
Factory 440
High Cohesion 314
Indirection 426
Layers 202
Low Coupling 299
Model-View Separation 331
names 279
Observer 463
Polymorphism 414
Protected Variations 427
Proxy 591
Publish-Subscribe 463
Pure Fabrication 421
Redirection Proxy 592
Remote Proxy 591
Singleton 442
State 191
Strategy 447
Template Method 634
Virtual Proxy 648

patterns
architectural 555
history 280

discipline dictionary 625

discipline dictionary persistence framework 627
key ideas 628
materialization 634
pattern-Cache Management 641
pattern-Object Identifier 630
pattern-Representing Objects as Tables 629
representing relationships in tables 651
requirements 628
persistent objects 626

Petri nets 484
Phase Plan 32, 676

phases in UP 33
physical architecture 621
physical design 614

PLanguage 545
planning
adaptive 674
iterative 673
polymorphism 414
in communication diagrams 246

in sequence diagrams 237
Polymorphism pattern 414
for payments 600
postcondition 184
a metaphor 186
in use case 74
precondition
in use case 74
primary actor 66
Principle of Least Surprise 359
private attributes
in UML 250
process
iterative 19
process view 658
profile
in UML 11, 259
project management 673
property
in UML 250, 260
multiple meanings in UML 252
structural, in UML 252
property string
for association ends 255
in UML 260

property strings
in class diagrams 256
protected attributes
in UML 250
Protected Variations 427
Proxy 591
Virtual Proxy 648
Proxy pattern 647
public attributes
in UML 250
Publish-Subscribe 463
Pure Fabrication 421

Q
qualified association 265, 531

qualifier 265, 531
quality attributes 57, 107
quality scenario 545

R
rake symbol
activity diagrams 481
Rational Unified Process 18
RDD 271, 276, 321
read-only attributes
in UML 250
Redirection Proxy 592
ref
tag in frames 235
ref frames 357
INDEX

refactoring 389
reference
  in interaction diagrams 235
reference attribute 450
reflexive association 532
relational cohesion 615
relational databases 626
Remote Proxy 591
replicates 571
representational decomposition 424
required interface
  in UML 263
requirements 54
  functional in Use-Case Model 64
  in the UP 58
  non-functional in Supplementary Specification 104
overview 53
various types 101
Requirements discipline 34
responsibilities 271, 276, 321
  and interaction diagrams 277
  and methods 276
  doing 276
  importance of 6
  knowing 276
  patterns 278
responsibility-driven design 276
return in sequence diagram 229
return type
  in class diagrams 256
  in UML operations 256
reverse engineering 398
risk-driven development 27
role 153
  of objects in RDD 276
  versus concept 529
rolename 255
  in DCDs 253
round-trip engineering 398
rules 58
  business or domain 58
  domain or business 117
RUP 18

S

SAD 656
scenario 63
schema mapping 628
Scrum 18, 40
sd frames 357
  frame tag 235
security view 658
selector
  in lifeline box 234
separation of concerns 204, 441, 554
sequence diagram 176, 222
activation box 228
conditional message 232
conditional messages 231
instance creation 229
iteration over collection 233
lifelines 230
looping 231
loops 177
message to class 236
message to self 229
messages 228
mutually exclusive conditional 232
object destruction 230
return 229
strength and weaknesses 223
Servlet 308
Session objects
  in EJB and Controller pattern 308
Singleton 442
  UML shorthand notation 444
socket notation 264
software architecture 200
Software Architecture Document 557, 655, 656
software class 14
software development process 18
specialization 404, 510
state 486
  modeling 521
state machine diagram 486
  example 491
  guard conditions 489
  nested states 489
  overview 485
  transition actions 489
State pattern 191, 642
statechart diagram
  nested states 489
state-independent 487
static method calls 236, 245
static operation
  in UML 250
stereotype 91, 241, 259
Strategy 447
structural properties
  in UML 252
Struts
  Java Struts example 310
subclass
  conformance 512
  creating 514
  in UML 250, 260
  partitioning 514
  validity tests 513
superclass
  creating 516
Supplementary Specification artifact 58, 102, 104, 107, 557
supporting actor 66
INDEX

SWEBOK 59
Swing
Java Swing example 309
symbol 136
synchronized method 250, 639
system behavior 176
system events 176, 184

system feature 112
system interface 184
system operation 176, 183, 302
system sequence diagram 173, 176

showing use case text 178
system use case 72

T

tagged value 241
tags
in stereotypes 259
technical memos 550
Template Method 634
templates 267
templatized types 267
test fixture 387
test-driven development 18, 29, 376, 386
test-first development 386

see test-driven development 376
testing 386
threads 238
threads in the UML 584
three-tier architecture 574
tier 207
time intervals 527
timeboxing 23
transition 487
transition phase 33

U

UI modeling
navigation modeling 490
UML 11
class diagrams 250
constraint 192
Data Modeling Profile 629
meta-model 11
overview 11
profiles 11, 629, 630
stereotype 241
tagged value 241
UML 2 14
Unified Process 18
unique
keyword in UML 255
unit testing 386

UP 18
agile 31
phases 33
use case 61, 63
abstract 497
actor 66
addition 497
and development process 95
base 497
black-box 81
brief 66
business 73
casual 66
concrete 497
essential style 80
extend 497
fully dressed 67
include 494
instance 63
postcondition 74
precondition 74
subfunction level 73
system 72
user goal level 73

when create abstract use cases 497
use case realization 273
use-case driven development 95
Use-Case Model 58, 64
use-case realizations 95, 321, 322
use-case view 657, 659
user task 88

V

value objects 163, 571
variation point 432, 542
VDM 194
version thrashing 613
Virtual Proxy 648
virtual proxy 647
visibility 333, 356, 363, 364
attribute 365
global 367
in class diagrams 253
in UML 250, 251
local 366
parameter 366
Vision artifact 58, 102, 109, 111
visual modeling 14

W

waterfall 18, 23
WebForms 307, 309
whitebox frameworks 634
WinForms 309