



Contents

Acknowledgments	xv
Foreword	xvii
Introduction	xix
Chapter 1 IT-Architectural Style	1
Discovering the Source of High Returns	2
A Long History of Success	3
A Higher Level of Communication	4
More than a Macro Pattern	7
The Next Level of Design	7
An Everybody-Wins Approach to Quality	8
Evolution without Revolution	9
Adding Innovation while Hedging Risks	10
The Importance of Style in IT Architecture	11
Designing an IT-Architectural Style	12
The Four Features of an IT-Architectural Style	16
Aspects Affecting Any IT-Architectural Style	24
Describing the Style Using Standards	28
Summary	29
Chapter 2 The Convergent Architecture Roadmap	31
The Anatomy of the Convergent Architecture	34
The Convergent Architecture Metamodel	35
The Development Model	36
The Full-Coverage Tool Suite (Architectural IDE)	37
The Technology Projections (J2EE/EJB)	42
The Operational Environment	44
Summarizing the Cumulative Improvements	47
Summary	51

Chapter 3	The Convergent Architecture Metamodel	53
	The Three Pillars of Holistic Architecture	54
	Project Design	57
	Business Design	57
	System Design	58
	Convergence and Convergent Engineering	58
	The Machine Shop Metaphor	61
	Reduced Abstraction Set Computing (RASC)	63
	Conceptual Isomorphism	65
	Component Metamorphosis	68
	Summary	71
Chapter 4	The Convergent Component Metamodel	73
	Overview and Fundamentals	74
	Architectural Layers	76
	Common Aspects of All Convergent Components	81
	The Technology Projection Component	83
	Component Dimensions and Personalities	85
	Assembly Components	91
	Accessor Components	92
	The Accessor Framework	93
	Model-Driven Accessors	94
	OPR Business Components	99
	The OPR Business Perspective	99
	The OPR Convergent Components	103
	Utility Components	107
	Summary	107
Chapter 5	The IT-Organization Model	109
	Features Common to All IT Organizations	111
	Organization, Process, and Resource Abstractions (OPRs)	112
	Organizations	112
	Processes	112
	Resources	113
	The IT Organization	116
	Worker Roles and Responsibilities	117
	The Architecture Organization	118
	Worker Roles and Responsibilities	118
	The IT Support Organization	121
	The Infrastructure and Base Systems Organization	122
	The Change and Configuration Management Organization	123
	The Project Information, Events, and Training Organization	125
	The Test Center Organization	127

The System Development Organization	129
Worker Roles and Responsibilities	129
The System Development Project	130
The Canonical Development Team	133
The Assembly Development Team	137
The Component Development Team	139
The Operational Systems Organization	141
The Transition Organization	142
The User Support Organization	142
The Infrastructure and Base Systems Organization	143
Summary	144
Chapter 6 The Development Process Model	145
Foundations and Structure	146
Overview: Workflows and IDE Support	148
Preparatory and Cross-Project Workflows	152
IT-Environment Workflow	152
T-Bar Business Modeling and Requirements Workflow	153
Architectural Evolution Workflow	158
Project Management Workflow	159
RUP Inception-Phase Variant (Project Initiation)	164
RUP Elaboration-Phase Variant	165
RUP Construction-Phase Variant	166
RUP Transition-Phase Variant	166
Development Environment Workflow	167
Configuration and Change Management Workflow (CCM Workflow)	169
Analysis-by-Design (ABD) Workflow	172
Refinement Continuity Across Workflows	178
Implementation Cycle Workflow	179
Test Workflow	182
Documentation Workflow	185
Deployment and Monitoring Workflow	188
Summary	190
Chapter 7 The Architectural IDE	193
The Convergent Business Object Modeler (C-BOM)	196
The Federated UML/XML Model Repository (C-MOD)	199
The Convergent Pattern Refinement Assistant (C-RAS)	200
The Convergent UML Refinement Assistant (C-REF)	203
The Convergent Translative Generator (C-GEN)	209
The Convergent Generator IDE (C-GEN-IDE)	211

The Implement, Deploy, and Test Environment (C-IX)	213
Summary	217
Chapter 8 Tutorial Example: Applying the Convergent Architecture	219
The J2EE/EJB System: A Convergent I-Bank	220
Tutorial Solution	220
Business Modeling with C-BOM	220
Setting Up a Project	222
Modeling CRC Cards	222
Modeling a Business Use-Case Scenario	223
Model Verification and Documentation	225
Refinement with C-RAS	227
Starting C-RAS	227
Refining the Account Business Object	228
Refining the Transfer Business Object	230
Model Verification	230
J2EE/EJB Modeling with C-REF/UML	232
Starting the C-REF	232
Modeling the Account Component	233
Modeling the Transfer Component	236
Modeling Deployable Components	237
Model Verification	237
Generating the EJB Components with C-GEN	238
Configuring the Code Generator	238
Running the Code Generator	240
Building, Deploying, and Testing the EJB Components	242
Code Customization	242
Build Support	246
Modeling the Web Accessors in C-REF	248
Generating Default Accessor Models	249
Extending the Default Accessor Model	253
Modeling the Web App Deployment Component	254
Generating the Web Application with C-GEN	255
Configuring the Code Generator	256
Running the Code Generator	257
Building, Deploying, and Testing the Web Application	259
Code Customization	260
Build Support	260
Running the Web Application	262
Summary	262
Bibliography	263
Notes	267
Index	271