

Mastering the SAP[®] Business Information Warehouse

Second Edition

Leveraging
the Business
Intelligence
Capabilities of
SAP NetWeaver[®]

Kevin McDonald
Andreas Wilmsmeier
David C. Dixon
W. H. Inmon



Contents

About the Authors	vii
Foreword	xix
Acknowledgments	xxi
Introduction	xxiii
Chapter 1 The Origins of Business Intelligence	1
Evolution of Information Processing	1
Data-Storage Advancements	2
Transaction Processing Dominates	3
Extract Files Appear	4
The Data Warehouse Is Conceived	6
What Is Data Warehousing?	6
The Data Model	7
Different Physical Tables	8
Integration and Transformation Processing	9
Metadata	10
Granular Data	11
Historical Data	12
Timestamping	12
Data Relationships	13
Generic Data versus Specific Data	13
Data Quality	14
Volumes of Data	15
Removing Dormant Data	15
Architected Solutions	16
Corporate Information Factory	16
Government Information Factory	22

Evolution of SAP	24
Evolution of SAP Reporting and Analysis	27
SAP BW and the New Dimension Applications	29
The Road to Business Process Integration	30
Summary	34
Chapter 2 The SAP NetWeaver Integration Platform	35
The Architectural Roots of SAP NetWeaver	35
NetWeaver Overview	38
Application Platform (Technology)	39
Application Server Architecture	39
Front-End Technologies	44
Mobile Infrastructure	46
System Landscape	48
Security	54
Administration	55
Process Integration	56
Integration Builder	58
Integration Repository	58
Integration Directory	58
Integration Server	59
Runtime Monitor	59
Information Integration	60
Business Intelligence	60
Master Data Management	60
Knowledge Management	65
People Integration	67
Portal Framework	67
Composite Application Framework	74
Summary	76
Chapter 3 SAP Business Information Warehouse Architecture	77
SAP BW Architectural Components	78
Metadata and Document Management	79
Metadata Management	79
Document Management	80
Elementary Metadata Objects	81
Obsolete Metadata Objects	84
Design, Monitoring, and Administration	85
Design	86
Monitoring	90
Administration	90
Data Acquisition and Transformation	93
Most Important Metadata Objects	94
Staging Engine	103
DataSource Manager	104
Data Storage	107

Master Data Manager	107
Data Store Object Manager	109
InfoCube Manager	109
Aggregate Manager	109
BI Accelerator	109
Information Lifecycle Manager	110
Data Access and Analysis	110
InfoProvider Interface	111
ODS BAPI	111
OLAP Cache	112
Analytic Engine	112
Analysis Process Designer	113
Information Distribution	113
Information Distribution Interfaces	113
Broadcasting	115
Presentation	115
Presentation Metadata Objects	115
BEx Analyzer and BEx Web Analyzer	119
BEx Query Designer	119
BEx Report Designer	119
BEx Web Application Designer	119
BI Patterns	120
Visual Composer	120
Planning	120
Analytic Engine	120
Planning Functions	121
Planning Sequences	121
Summary	121
Chapter 4 Information Modeling	123
Information Modeling Prerequisites	124
Understanding the SAP BW Metadata Model	127
Master-Data Data Model	127
The InfoCube Data Model	131
The DataStore Object Data Model	134
Developing an Information Model	134
Multidimensional Modeling	136
Additional Information Modeling Options	164
Summary	170
Chapter 5 Enterprise Data Warehousing	171
Business Intelligence Strategy	172
Architecture	175
Layers of an EDW Architecture	176
Topology	179
System Landscapes	185

Data Integration	186
Master Data Integration	187
Transaction Data Integration	189
Data Quality	189
Modeling the Layers of an EDW	191
Modeling the Data Staging Layer	191
Modeling the Operational Data Store	191
Modeling the Data Warehouse Layer	192
InfoMart Layer	194
Modeling Support for Data Integration	194
Modeling with Global Keys	195
Modeling with Qualified Local Keys	196
Concatenation Versus Compounding	198
Mapping Approaches	198
Modeling Support for Data Historization	199
Tracking History of Transactional Data	200
Tracking History of Master Data	201
Governance	202
Standards	203
Organization	204
Processes	206
Training	207
Project Marketing	207
Summary	208
Chapter 6 Data Acquisition and Transformation	209
Data Acquisition	214
Classes of Data	215
Data Flow and Integration	218
Dimensions of Data Acquisition	221
OLTP Technology Considerations	224
Architecture	228
Metadata Flow	228
Data and Control Flow	231
Example of an Application-Specific Extractor	234
Client-Specific Data Extraction Options	235
Architecture	239
Data and Control Flow	240
Architecture	241
Data and Control Flow	242
Data and Control Flow	243
Architecture	245
Data and Control Flow	246
Ascential DataStage	246
Architecture	248
Data and Control Flow	250

Transformation	251
Data Integration Transformations	252
Application Logic Transformations	254
Reference Objects for Transformations	256
Architecture and Data Flow	257
Persistency Considerations	258
Multilevel Staging Considerations	259
Conversion Routines	263
Aggregation	264
Rule Types	264
Transformation Routines	271
Loading	280
Master Data Texts	282
Master Data Hierarchies	282
Summary	286
Chapter 7 Data Access, Analysis, and Information Distribution	289
Data Access	289
Query Processing Overview	290
InfoProvider Interface	293
DataStore Objects and PSA APIs	296
Information Analysis	296
Knowledge-Discovery Process	297
Analytic Services	298
Information Distribution	324
Broadcasting	326
Interface Options for Third-Party Presentation Tools	331
The Business Explorer API	341
Summary	342
Chapter 8 Information Presentation	343
BEx Presentation Components	343
BEx Query Designer	345
BEx Analyzer	354
BEx Web	359
Generic Presentation Options	370
Personalization	371
Print Versions — PDF Output	373
Local Calculations	373
Other Presentation Options	377
Crystal Reports Integration	378
BEx Mobile Intelligence	380
Portal Integration	381
Visual Composer	382
Summary	382

Chapter 9	Integrated Planning	385
	Integrated Planning Positioning	386
	History and Trends	386
	Definition of Planning	390
	Architecture Considerations	393
	Integrated Planning Technology	401
	Architecture	402
	Evolution	402
	Planning Modeler	405
	Integrated Planning Data	406
	Information Logistics	407
	Information Modeling	409
	Data Access and Locking	414
	Semantic Rules	422
	Planning Functions	426
	Controlling Function Behavior	427
	Function Types	431
	Basic Functions	435
	Advanced Functions	438
	Integrated Planning User Interface	450
	Runtime Capabilities	450
	Design-Time Capabilities	453
	Integrated Planning Process Control	460
	Status and Tracking	461
	BW-BPS Coexistence	463
	Best and Worst Practices	466
	Delta Change Modeling	466
	Enterprise Design	470
	Summary	477
Chapter 10	Business Analytics	479
	Analytic Application Architecture	482
	What Is Business Content?	485
	Business Content Progression	489
	Horizontal Growth	489
	Vertical Growth	490
	Using Business Content	492
	Myths	493
	Usability	494
	Challenges	496
	Customer Relationship Analytics	501
	Analytic Engines	502
	Customer Behavior Analysis	502
	Supply Chain Analytics	505
	SCOR Model	506
	Supply-Chain Cockpit	510

Demand Planning (DP)	512
Network Design and Production Planning	519
Financial Analytics	521
Corporate Performance Management	522
Enterprise Planning	528
Financial Consolidation	535
Summary	540
Notes	541
Chapter 11 Administration	543
Application-Oriented Administration	544
Process Chains	546
Data Management Processes	554
Application Management Processes	570
Monitoring	573
Troubleshooting	581
System-Oriented Administration	582
Information Lifecycle Management	583
Authorizations	588
Transports	597
Upgrades	601
Summary	604
Chapter 12 Performance Planning and Management	605
Performance Planning	607
Managing User Expectations	608
Information Modeling	609
Process Design	623
System Landscape Design and Setup	623
Performance Management	631
BI Statistics	632
Optimizing Query Performance	635
Data Loading and Data Management	648
Information Lifecycle Management	651
System Performance	652
Summary	659
Appendix A Acronyms	661
Index	669