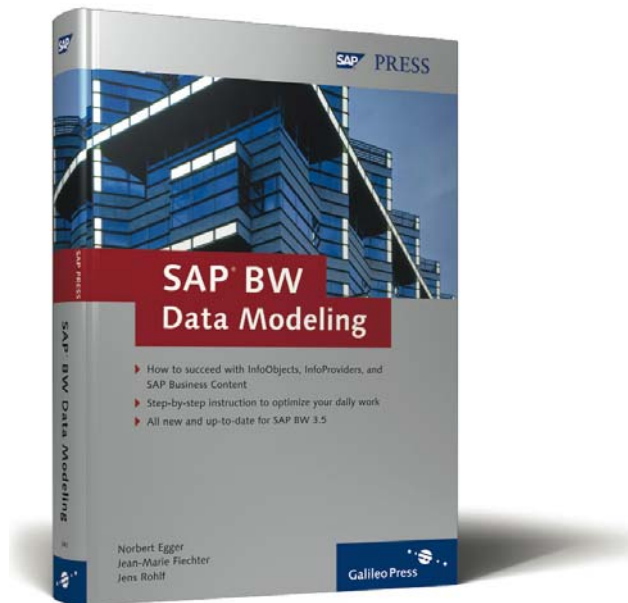


Norbert Egger, Jean-Marie R. Fiechter, Jens Rohlf

SAP BW Data Modeling



SAP PRESS

Contents

Preface	13
Foreword	15
Introduction and Overview	17
Introduction	17
Structure of the Book	18
Working with This Book	19
After You've Read the Book	20
Acknowledgements	20
1 Data Warehousing Concepts	23
1.1 Introduction	23
1.2 OLTP and DWH: Different Requirements	24
1.3 Historical Observations	26
1.4 Typical Characteristics of Data Warehouses	29
1.4.1 Subject-oriented	30
1.4.2 Integrated	31
1.4.3 Time Variance	32
1.4.4 Non-volatility	33
1.5 Data Warehouse Architecture	34
1.5.1 Layers of the Logical Architecture	37
1.5.2 Data Acquisition (ETL)	38
1.5.3 Data Storage and Query Optimization	41
1.5.4 Data Provision	47
1.5.5 Administration	50
1.6 OLAP Designs	51
1.6.1 Multidimensional OLAP (MOLAP)	51
1.6.2 Relational OLAP (ROLAP)	52
1.6.3 Hybrid OLAP (HOLAP)	53
1.7 The Multidimensional Data Model	54
1.7.1 Key Figures and Fact Tables	55
1.7.2 Characteristics and Dimensions	55
1.7.3 Special Dimensions	57

1.8	Navigation in Multidimensional Data Sets	58
1.8.1	Slicing, Dicing, Ranging, and Rotation	58
1.8.2	Drilldown and Rollup	60
1.8.3	Drill Across	60
1.8.4	Drill Through	60
1.9	The Classic Star Schema	61
1.10	The Classic Snowflake Schema	62
1.11	The Enhanced Star Schema of SAP BW	62

2 SAP Business Information Warehouse— Overview of Components **67**

2.1	The Architecture of SAP BW	67
2.2	Data Storage in SAP BW	69
2.2.1	InfoObjects as the Basis	69
2.2.2	InfoProviders	70
2.3	Data Acquisition	75
2.3.1	Components of the Data Acquisition Process: Sources of Data and Their DataSources	75
2.3.2	Components of the Data Acquisition Process: InfoSources	77
2.3.3	Components of the Data Acquisition Process: Update Rules	78
2.3.4	Components of the Data Acquisition Process: Requesting the Data Transfer and Monitoring	79
2.3.5	Components of the Data Acquisition Process: Persistent Staging Area (PSA)	80
2.3.6	The ETL Process	80
2.4	Reporting and Analysis Tools	81
2.4.1	SAP BW Components and Third-Party Tools	81
2.4.2	SAP Business Explorer Query Designer	83
2.4.3	Web Application Designer	85
2.4.4	The Runtime Environment of Web Applications	88
2.4.5	SAP Business Explorer Analyzer	88
2.4.6	SAP Business Explorer Information Broadcasting	90
2.4.7	Additional SAP BW Reporting Functions	91
2.4.8	The Reporting Agent	92
2.4.9	Reporting Functionality and Frontends for SAP BW	94
2.5	Open Hub Service	96
2.6	Additional Functions and Components	96
2.7	SAP Business Content	97
2.8	The Position of SAP Business Information Warehouse	99

3 Introduction to Data Modeling 101

3.1	Introduction	101
3.2	Some Theory	103
3.3	Conceptual Approaches to Modeling: Excursus	105
3.3.1	Designs Based on the Entity Relationship Model	105
3.3.2	Designs Based on the Object-Oriented Model	109
3.3.3	Designs Without Reference to a Conventional Model	112
3.4	Back to Practice: Procedures for DWH Projects	113
3.5	Modeling (Conceptual and Physical Schema)	116
3.5.1	Determining All the Required Objects (Characteristics, Attributes, and Key Figures)	116
3.5.2	Displaying the Relations Between Individual Objects	117
3.5.3	Dimensioning of Key Figures	117
3.5.4	A Step Toward a Physical Data Model: Determining the Objects Relevant to Reporting	119
3.5.5	The Golden Rules of Dimensional Modeling	120

4 Sample Scenario 121

4.1	The Model Company: CubeServ Engines	121
4.1.1	Company Structure	121
4.1.2	Infrastructure	122
4.2	Requirements of the Case Study	124
4.2.1	Requirements of the Analytical Applications	124
4.2.2	Planning Requirements	126
4.3	Procedure and the SAP Components Involved	127
4.4	Details on Data Modeling	128
4.4.1	InfoProviders	128
4.4.2	InfoObjects	129
4.5	A Look Ahead: Additional Steps in the Implementation	131

5 InfoObjects of SAP BW 133

5.1	InfoAreas and InfoObjectCatalogs	133
5.1.1	Creating Structures and Hierarchies	133
5.1.2	Setting Up InfoAreas	135
5.1.3	Setting Up InfoObjectCatalogs	139
5.2	InfoObjects of SAP Business Content	142
5.2.1	Activating an Individual InfoObject of SAP Business Content	143
5.2.2	Transferring an SAP Business Content InfoObject into an InfoObjectCatalog	148

5.2.3	Transferring an SAP Business Content InfoObject In Data Flow Before	150
5.2.4	Transferring SAP Business Content InfoObjects by Selecting InfoCubes In Data Flow Flow Before	151
5.2.5	Simultaneous Transfer of Several SAP Business Content InfoObjects into an InfoObjectCatalog	153
5.3	Configuration of Your Own InfoObjects Based on SAP Business Content InfoObjects	157
5.3.1	The Need for Configuration of Your Own InfoObjects: Example	157
5.3.2	Creating Your Own InfoObject with Reference to an InfoObject of SAP Business Content	159
5.3.3	Creating Your Own InfoObject Based on InfoObjects of SAP Business Content with a Template	161
5.4	Modifying SAP Business Content InfoObjects	162
5.4.1	Inserting Attributes into SAP Business Content InfoObjects	162
5.4.2	Modifying the Properties of SAP Business Content InfoObjects	165
5.4.3	Source System Compounding	169
5.5	Creating Your Own InfoObjects	172
5.5.1	Introduction	172
5.5.2	Creation of an InfoObject— "Characteristic" Type: The Harmonized Version	173
5.5.3	Creation of an InfoObject— "Key Figure" Type: Sales Order Stock in Document and Group Currency	182

6 InfoProviders of SAP BW 189

6.1	Selective Approach	189
6.2	Characteristics as a Basis for Master Data Reporting	189
6.3	Financial Reporting	192
6.3.1	Introduction	192
6.3.2	The Components of an ODS Object	193
6.3.3	Configuring an ODS Object to Consolidate the Actual Data on the Basis of an SAP Business Content ODS Object	195
6.3.4	Creating an InfoCube to Store the Actual Data on the Basis of an SAP Business Content BasicCubes	199
6.3.5	Creating an InfoCube to Store Plan Data with a Template	210
6.3.6	Creating a MultiProvider as a Basis for Plan-Actual Comparisons	216
6.4	Profitability Analysis	223
6.4.1	Data Model and Data Flow: Overview	223
6.4.2	ODS: Profitability Analysis—Actual Data	224
6.4.3	Creating an InfoSet for Document Reporting in the Profitability Analysis	233
6.4.4	Creating an InfoCube for Actual Data of the Profitability Analysis	235

6.4.5	Creating an InfoCube for Plan Data of the Profitability Analysis	241
6.4.6	Creating a MultiProvider as a Basis for Plan-Actual Comparisons	246
6.5	Sales & Distribution	252
6.5.1	Requirements to Incoming-Order and Sales-Order-Stock Reporting	252
6.5.2	ODS Objects for Incoming-Order Reporting: Usability of SAP Business Content and the Need for Enhancements	253
6.5.3	Creating ODS Objects for Incoming-Order Reporting	254
6.5.4	Creating an InfoSet for Reporting with the Allocations of Sales Document Items	260
6.5.5	Creating InfoCubes for Incoming-Order Reporting	265
6.5.6	Creating a MultiProvider for Incoming-Order Reporting	271
6.5.7	Creating the InfoCube for Analysis of Sales Order Stocks	274

7 SAP Business Content 285

7.1	Elements of SAP Business Content	286
7.2	Fundamental Problems of SAP Business Content	286
7.2.1	Technical Problems	287
7.2.2	Data Model	287
7.3	Using SAP Business Content Versus Proprietary Objects	292
7.4	SAP Business Content in Selected Application Areas	293
7.4.1	Business Content for Financials	293
7.4.2	Business Content for Supply Chain Performance Management ..	295
7.4.3	Business Content for Human Resources	300
7.5	Conclusion	303

A Abbreviations 305

B InfoObjectCatalogs 307

B.1	InfoObjectCatalog ZECOPA01CHA01	307
B.2	InfoObjectCatalog ZECOPA01KYF01	308
B.3	InfoObjectCatalog ZEFILO1CHA01	309
B.4	InfoObjectCatalog ZEFILO1KYF01	309
B.5	InfoObjectCatalog ZESALES01VAHDRCHA01	309
B.6	InfoObjectCatalog ZESALES01VAHDRKYF01	310
B.7	InfoObjectCatalog ZESALES01VAITMCHA01	311
B.8	InfoObjectCatalog ZESALES01VAITMKYF01	312
B.9	InfoObjectCatalog ZESALES01VASCLCHA01	312
B.10	InfoObjectCatalog ZESALES01VASCLKYF01	313

C ODS Objects 315

C.1	ODS Object ZECOPA01	315
C.1.1	Key Fields	315
C.1.2	Characteristics	316
C.1.3	Key Figures	317
C.2	ODS Object ZEFIGLO1	318
C.2.1	Key Fields	319
C.2.2	Characteristics	319
C.2.3	Key Figures	319
C.3	ODS Object ZEVAHDO1	320
C.3.1	Key Fields	320
C.3.2	Characteristics	320
C.3.3	Key Figures	321
C.3.4	Navigation Attributes	322
C.4	ODS Object ZEVAHDO2	323
C.4.1	Key Fields	323
C.4.2	Characteristics	323
C.4.3	Key Figures	325
C.4.4	Navigation Attributes	325
C.5	ODS Object ZEVAHDO3	326
C.5.1	Key Fields	326
C.5.2	Characteristics	327
C.5.3	Key Figures	328
C.5.4	Navigation Attributes	328
C.6	ODS Object ZEVAHDO4	328
C.6.1	Key Fields	329
C.6.2	Characteristics	329
C.6.3	Key Figures	329

D InfoCube »Actual Data: Profit and Loss Statement« 331

D.1	InfoAreas with InfoCubes	331
D.1.1	InfoArea ZECOPA01 Profit and Loss Statement	331
D.1.2	InfoArea ZEFIGLO1 Financials—General Ledger	331
D.1.3	InfoArea ZESALES01 Sales	331
D.2	InfoCube ZECOPAC1	332
D.3	InfoCube ZECOPAC2	335
D.4	InfoCube ZEFIGLC1	337
D.5	InfoCube ZEFIGLC2	339
D.6	InfoCube ZEKDABC1	340
D.7	InfoCube ZEVAHDC1	342
D.8	Dimension ZEKDABC13 Distribution Channel	343

D.9	InfoCube ZEVAHDC2	345
D.10	Dimension ZEVAHDC23 Data Type	346
D.11	InfoCube ZEVAHDC3	348
D.12	Dimension ZEVAHDC33 Data Type	348

E MultiProviders 351

E.1	MultiProvider ZECOPAM1	351
E.2	MultiProvider ZEFIGLM1	354
E.3	MultiProvider ZEVAHDM1	355

F InfoSets 359

F.1	InfoSet ZECOPA11	359
F.1.1	ODS ZECOPAO1 Profit and Loss Statement	359
F.2	InfoSet ZEVAHD11	362
F.2.1	ODS ZEVAHDO4 Sales Document Schedule Lines (Order)	362
F.2.2	ODS ZEVAHDO2 Sales Document Item Data (Order)	362
F.2.3	Link	364

G Transaction Codes 365

G.1	Transactions in SAP BW	365
G.2	SAP R/3 Transactions Relevant to SAP BW	368

H Metadata Tables 369

H.1	InfoObject	369
H.2	InfoCube	369
H.3	Aggregate	370
H.4	ODS Object	370
H.5	PSA	370
H.6	DataSource (= OLTP Source)	370
H.7	InfoSource	370
H.8	Communications Structure	371
H.9	Transfer Structure	371
H.10	Mapping	371
H.11	SAP BW Statistics	371

I	Glossary	373
J	Literature	423
J.1	The SAP BW Library	424
	Authors	427
	Index	429

Preface

It is with pleasure that I have accepted a request from Norbert Egger to write a preface for this book, *SAP BW Data Modeling*. This book will substantially contribute to the success of SAP BW projects in many companies.

Many customers already use SAP BW as a strategic tool for companywide control of important processes. The implementation teams at customer sites fulfill the requirements of countless projects and thus serve numerous users. During the past few years, more and more "casual users"—those who generally query prepared information—have joined the analysts and power users previously served by the teams.

All these users must access a swiftly increasing volume of data. Just a few years ago, SAP BW systems larger than one terabyte were usually considered an exception. In many companies, such systems are now the rule or will be in the near future.

Projects based on such systems require accurate data modeling. By "accurate," we mean more than just the ability to handle existing volumes. Accuracy is urgently needed in preparing the systems for future requirements and in keeping them flexible enough to meet the changing requirements of business intelligence systems, which ultimately reflect business changes in general.

Norbert Egger and his co-authors combine their rich experience from many successful implementations of SAP BW with their profound knowledge of SAP BW 3.5, particularly its new features. This marriage of experience and knowledge yields tips and suggestions that this book provides in an easily readable form.

I hope that all readers learn from this book and enjoy reading it. And I'm sure that, as readers, you'll be able to implement many suggestions from the book in your projects.

Walldorf, April 2005

Heinz Häfner

Vice President Business Intelligence: SAP AG

Foreword

When Wiebke Hübner, then an editor at SAP PRESS, asked me in December 2002 if I wanted to write a book on SAP BW, I waved her off. Such a book would have to consist of too many pages to offer an adequate presentation, I thought. I also believed that a viable market for such a book would not exist, so the effort would be of no value. Luckily, she remained insistent, which resulted in our first book on SAP Business Information Warehouse, *SAP BW Professional*. I paid particular attention to the rapid development of the reporting functionality in SAP BW 3.x and other topics in that book.

Background

Besides the fact that writing the book proved enjoyable to me, the general interest that this work generated afterwards surprised me a great deal. That's why I'm so pleased to thank you, the readers, at the very beginning of this book for your great interest and the wonderful feedback that you've provided. You should note that a second edition of the first book has already been published in several languages.

Thanks to readers

I hope to contribute to companies being able to meet the challenges of adequately mining and using information. That includes the successful use of business intelligence tools. In SAP BW, SAP has offered a very powerful tool for several years now. However, implementations often fail to reach an appropriate standard, so that the question often arises regarding the ability of such a product to function in real life. Therefore, my hope is to increase knowledge about the options and functionality of business intelligence tools so that future implementations and the operation of these solutions are more successful and useful.

My vision

Based on the great interest shown in the first book, the rapid development of SAP Business Intelligence components, and the welcome growth of our company, the management of the CubeServ Group decided to approach the topic even more consistently in collaboration with SAP PRESS. Gradually, we happened upon the idea of offering a comprehensive compendium—a compendium that would describe the functionality of SAP BW in even greater detail.

The idea of a compendium

It became readily apparent that one book and one individual involved in the life of a project could not complete such a monumental task: The functionality (luckily) is too vast and such a book would be too comprehensive. We therefore needed to create a multivolume work that would focus on specific aspects, such as data modeling, extraction, transforma-

The SAP BW Library

tion, and loading (ETL) processes, reporting, or planning. The notion of a new series, the *SAP BW Library*, began to take shape.

Because our wonderful CubeServ team consists of many highly motivated co-workers, we were quickly able to create a team of authors that was willing to split up the work and produce a book on each topic.

I'm very pleased to be able to present our readers with the first volume of the *SAP BW Library*. Because several authors are already working on the forthcoming volumes, I'm confident that, step by step, this series will offer you a comprehensive description of the functionality of SAP BW. If interest continues to remain high, additional books will appear after the first group of four volumes and address SAP Business Intelligence tools in even more detail.

Jona, Switzerland—April 2005 **Norbert Egger**

Introduction and Overview

The ability to mine and use information adequately is increasingly becoming a global key competency of companies. In addition to good management methods and an appropriate organization, successful implementation of data-warehouse processes is the fundamental precondition for companies to react to new opportunities and risks in a timely and appropriate manner.

Introduction

This book is the first volume of a new series, the *SAP BW Library*; all its authors are considered experts in business intelligence and work at the CubeServ Group.¹ This volume addresses the fundamentals of *data modeling*; the forthcoming volumes of the *SAP BW Library* deal with other topics—first the basics are introduced and then the topic itself is addressed in more detail. The topics include *data retrieval, reporting, analysis, planning, and simulation*.

**Volume 1 of the
SAP BW Library**

To enable easy access to the complex subject matter of SAP Business Information Warehouse (SAP BW), we've decided to work as close to the actual implementation and with as many examples as possible in all volumes of the *SAP BW Library*. Therefore, the foundation for our books is a uniform case study developed by the authors: a virtual company (CubeServ Engines). The case study will be used to present and communicate all the important requirements of business intelligence applications in a manner that reflects real life experiences.

**Comprehensive
case study**

The first goal of this book is to introduce the basic concepts (data warehouse and so on) of SAP BW. A second goal is to present the steps involved in implementing a data model in SAP BW systematically and step by step. Our case study should serve as an unbroken thread as you go through the material.

Goal of this book

The detailed description of the components and implementation steps will enable the various groups within a company that deal with SAP BW to comprehend the material even if they have no deeper understanding of IT. We hope to use this procedure to make SAP BW projects more successful so that employees of user and IT departments, application

¹ See Appendix L for an overview of the forthcoming volumes of the *SAP BW Library*.

experts, and consultants can gain a profound understanding and find a common basis of knowledge and language.

Structure of the Book

Four topic areas This book can be divided into four essential areas:

1. Background and theoretical basics of SAP BW data modeling (Chapters 1–3)
2. Presentation of the case study (Chapter 4)
3. Detailed presentation of three major topic areas: InfoObjects, InfoProviders, and SAP Business Content (Chapters 5–7)
4. Additional supporting information (Appendices)

Chapter 1
Data warehousing concepts Chapter 1 gives you an overview of the basic concepts and architecture of data warehouse systems. The chapter examines the theoretical and historical background and the basic modeling schema.

Chapter 2
Overview of components Chapter 2 provides a general overview of the architecture and functionality of SAP BW. This chapter presents all the important innovations, enhancements, and improvements of SAP BW 3.5

Chapter 3
Data modeling Chapter 3 provides an overview of the basic concepts of data modeling. The quality of data modeling and the power of the underlying systems determine the performance and successful use of a data warehouse.

Chapter 4
Sample scenario Chapter 4 offers you an overview of the basic elements of the case study used in all volumes of the SAP BW Library. In light of the topic of this book, the chapter then looks at specific aspects of *data modeling* in detail.

Chapter 5
InfoObjects As InfoObjects, characteristics and key figures form the foundation of the data model in SAP BW. Chapter 5 shows you how to use and configure the InfoObjects of SAP Business Content and how to define your own InfoObjects.

Chapter 6
InfoProviders Chapter 6 sets up the InfoProviders of our case study step by step. It also examines the individual types of InfoProviders in detail. The chapter uses examples to show you how to create InfoProviders and explains the distinctive features that you must consider.

Chapter 7
SAP Business Content Chapter 7 describes the preconfigured solution, SAP Business Content, which SAP delivers with SAP BW. In particular, it addresses the solution's strengths and weaknesses and recommends how you can best use SAP Business Content for your own purposes.

The appendices provide additional assistance for your daily work: overviews, documentation on various data models, and, in particular, a comprehensive glossary.

Appendices:
Overviews and
glossary

Working with This Book

As noted, the goal of this book is to offer users of SAP BW from various areas and differing levels of knowledge a strong foundation for modeling data with SAP BW.

Readers with various levels of knowledge and individual needs for information can easily use this book.

**What do you want
to know?**

- ▶ Readers who wish to study SAP Business Information Warehouse starting from its conceptual design should begin by reading the theoretical approach in Chapter 1, *Data Warehousing Concepts*.
- ▶ Readers primarily interested in a quick overview of SAP BW and the enhancements in SAP BW 3.5 should begin with Chapter 2, *SAP Business Information Warehouse—Overview of Components*, and then read the details in the following chapters if they wish.
- ▶ Chapter 1 (*Data Warehousing Concepts*), Chapter 2 (*SAP Business Information Warehouse—Overview of Components*), and Chapter 7 (*SAP Business Content*) are especially appropriate for readers who want an overview of the topic.
- ▶ Readers interested in individual aspects, such as integration of source systems, profitability key figures, use of Operational Data Source (ODS) objects, and so on, can and should use this book as reference material. They can find information on specific topics with the table of contents, the index, and the glossary.

To make it even easier for you to use this book, we have adopted special symbols to indicate information that might be particularly important to you.

Special symbols

▶ Step by step

An important component of this book is to introduce complex work with SAP BW step by step and explain it to you exactly. This icon refers you to the beginning of a step-by-step explanation.



▶ Note

Sections of text with this icon offer you helpful hints and detailed information to accelerate and simplify your work.





► **Recommendations**

This book offers tips and recommendations that have been proven successful in our daily consulting work. This icon indicates our practical suggestions.



► **Caution**

Particular attention is required when you see this icon. The accompanying text tells you why this is the case.

After You've Read the Book ...

Even after you've read the book, we'd like to continue to assist you with advice and help. We offer the following options.

► **SAP BW Forum**

Under the motto of "Meet the Experts," you can use an Internet forum to send additional questions to the authors and share them with the business intelligence community. Stop by for a visit:
www.bw-forum.com.

► **Email to CubeServ**

If you have additional questions, you're invited to send them to the authors directly by email. See Appendix K, *Authors*, for their email addresses.

► **Information on the CubeServ Web site**

You can also receive additional information from the CubeServ Group by email. You can register for this service by sending an email that contains your personal registration code for this book to
bw-books@cubeserv.com.

Acknowledgements

Books are never produced without the support and collaboration of many. That's why we'd like to express our special thanks to the following people for their collaboration, help, and patience.

Norbert Egger

Because various co-workers on our CubeServ team are creating the SAP BW Library, I'd like to thank all the authors sincerely for their participation. Without them, work on this book would have been impossible because it requires comprehensive and specialized knowledge. I also wish to thank all the employees of the CubeServ Group. I'd like to thank SAP, especially Dr. Heinz Häfner, and the publisher for their cooperation and

patience with me. Above all, I thank my family, especially my beloved wife. Despite all my writing efforts, we were married last year. She supported me during this work by taking over all the tasks of managing the family and with a great deal of patience and care.

Jean-Marie R. Fiechter

I wish to thank Wiebke Hübner for all her help. But I'd especially like to thank my wife, Karin, and my two children, Patrick and Olivier, for the patience and understanding they showed me as I wrote my sections of this book. I wish to dedicate my work to all three of them.

Jens Rohlf

Without the support of and feedback from all employees at the CubeServ Group, the creation of this book would have been impossible—many thanks.

I'd especially like to thank my wife, Claudia, for the time and space she gave me as I worked on the book.

Jona, Switzerland and Flörsheim am Main, Germany—April 2005

Norbert Egger

Jean-Marie R. Fiechter

Jens Rohlf

5 InfoObjects of SAP BW

InfoObjects, characteristics and key figures form the foundation of the data model in SAP Business Information Warehouse. This chapter shows you how to use and modify the InfoObjects of SAP Business Content and how to define your own InfoObjects.

5.1 InfoAreas and InfoObjectCatalogs

5.1.1 Creating Structures and Hierarchies

InfoObjects are always stored in folders; the folders are called *InfoObjectCatalogs*. Note the distinction between InfoObjectCatalogs for characteristics and those for key figures (see Figure 5.1). SAP Business Information Warehouse (SAP BW) automatically assigns InfoObjects that have not been explicitly assigned to an InfoObjectCatalog to a default InfoObjectCatalog. The following default InfoObjectCatalogs are available:

- ▶ Unassigned units
- ▶ Unassigned key figures
- ▶ Unassigned characteristics
- ▶ Unassigned time characteristics

Using InfoObjectCatalogs systematically

Other than organizing InfoObjects, InfoObjectCatalogs have no other function. Nevertheless, we recommend the creation and use of logically grouped InfoObjectCatalogs. Doing so simplifies work with data modeling and data retrieval because it shortens the system response time during these activities.



Classification with InfoObjectCatalogs

InfoObjectCatalogs are also stored in folders. These folders are called *InfoAreas* (see Figure 5.1). All InfoObjectCatalogs that are not explicitly assigned to an InfoArea are stored in the **Unassigned Nodes** InfoArea.

Classification with InfoAreas

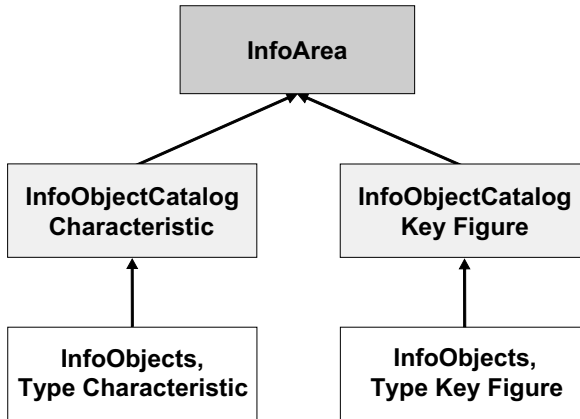


Figure 5.1 Classification Within InfoAreas

**Hierarchical
classification of
InfoAreas**

You can also classify InfoAreas hierarchically. In this manner, you can classify business-intelligence applications into various logical components.

Our model company, CubeServ Engines, uses the following levels of classification (see Figure 5.2):

- ▶ The highest level for all the analytical applications (here: "CubeServ Engines Business Intelligence Applications").
- ▶ A subordinate level for the application areas Finance & Accounting and Sales.
- ▶ If needed, another level for the individual analytical applications (Financials—General Ledger and Profitability Analysis) beneath the related application area (Finance & Accounting in the example).

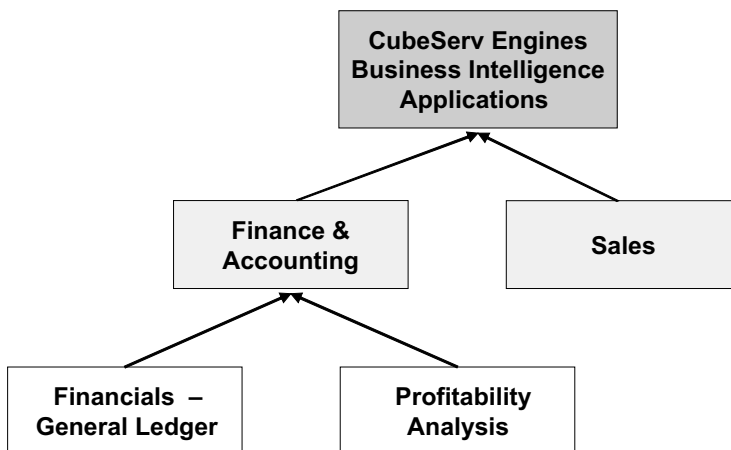


Figure 5.2 Classification of InfoAreas

Using InfoAreas systematically

Other than the classification of InfoObjectCatalogs and the grouping of subordinate InfoAreas, InfoAreas have no other function. Nevertheless, we recommend the creation and use of logically grouped InfoAreas. Doing so simplifies work with data modeling, data retrieval, and with the Business Explorer (BEx) because it's easier to find objects. This approach also shortens system response time during these activities.



In the Administrator Workbench of SAP BW, InfoAreas are used in the **InfoProvider** and **InfoObjects** views, where they are the highest node of the hierarchy, corresponding to the view of the **InfoProvider** or **InfoObjects** nodes (see Figure 5.8).

InfoAreas in the Administrator Workbench

An InfoObjectCatalog is a grouping of InfoObjects according to application-specific viewpoints. There are two types of InfoObjectCatalogs: characteristic and key figure. InfoAreas help classify the InfoArea, InfoProvider, and InfoObjectCatalog metaobjects in SAP Business Information Warehouse.



5.1.2 Setting Up InfoAreas

The following example sets up InfoAreas in the **InfoObjects** view of the Administrator Workbench. You can open this view from the role menu or with Transaction RSA14 (see Figure 5.3).

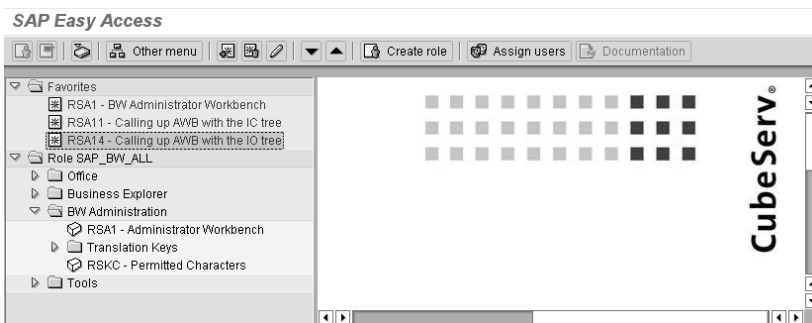


Figure 5.3 Opening the Administrator Workbench, InfoObjects View

Creating the Top-Level InfoArea

- ▶ To create InfoAreas, highlight the uppermost node of the **InfoObjects** hierarchy node in the **InfoObjects** view of the Administrator Workbench. Right-click to open the context menu.



- ▶ In the context menu, select the entry **Create InfoArea** (see Figure 5.4, Step 1).
- ▶ Enter the technical name and a description of the InfoArea in the **Create InfoArea** popup (Step 2).
- ▶ Click **Next (Enter)** to create the InfoArea (Step 3).

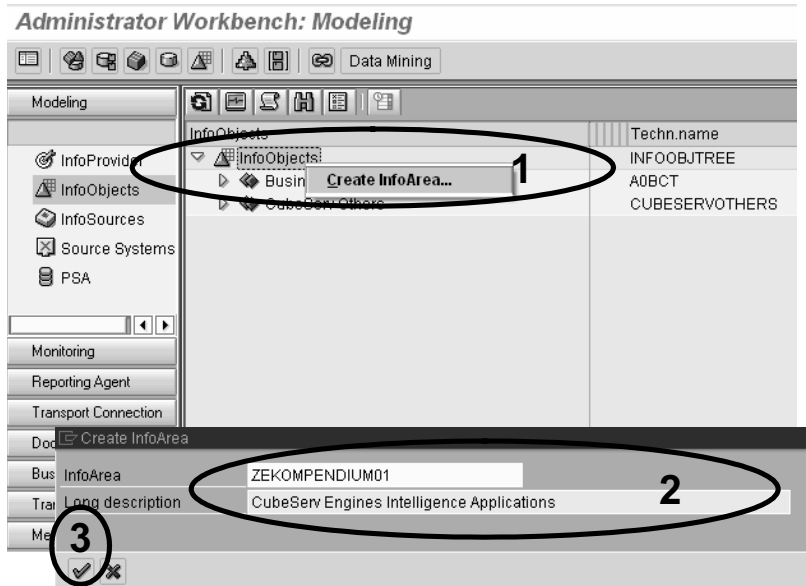


Figure 5.4 Creating the Top-Level InfoArea

Repositioning an InfoArea

The InfoArea you just created is shown last in the display. You can position the InfoArea to your liking by using Drag&Drop:

- ▶ To do so, highlight the InfoArea to be moved with the mouse, keep the mouse button pressed, and simply drag the InfoArea to the highest hierarchy node, **InfoObjects** (see Figure 5.5, Step 1).
- ▶ The object is then positioned according to the Drag&Drop settings (see Figure 5.5, Step 2).

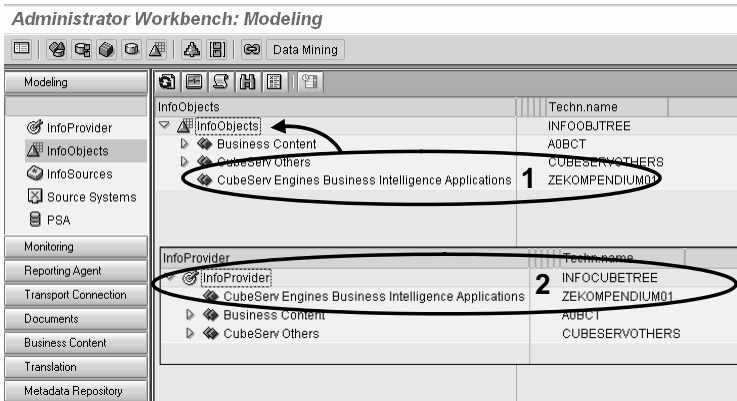


Figure 5.5 Placing or Moving an InfoArea

Activating Drag&Drop

In some cases, the **Drag&Drop** function might be switched off. If it is and you attempt to move an object, an **Information** popup appears (see Figure 5.6, Step 1); confirm the popup with the **Next (Enter)** button (see Figure 5.6, Step 2). If you want to permit the function, proceed as indicated by the popup information:

- ▶ Use Transaction SM30 to start maintenance of the table view for table RSADMINSV.
- ▶ Deactivate the **Drag&Drop off** option (see Figure 5.6, Step 3).
- ▶ Save this setting (Figure 5.6, Step 4).
- ▶ When you restart the Administrator Workbench of SAP BW, the **Drag&Drop** function will be active.

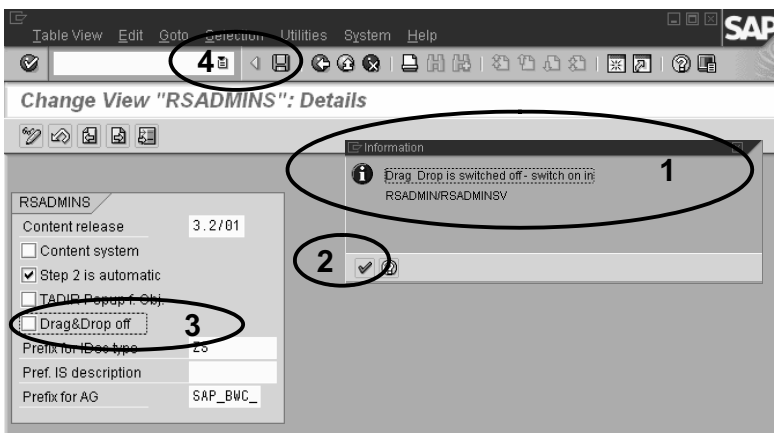


Figure 5.6 Activating Drag&Drop for the Administrator Workbench

Setting Up Subordinate InfoAreas



- ▶ You can set up additional InfoAreas by highlighting the uppermost InfoArea and right-clicking to open the context menu.
- ▶ In the context menu, first select **Create...** (see Figure 5.7, Step 1).
- ▶ Then enter the technical name and a description in the **Create InfoArea popup** (see Figure 5.7, Step 2).
- ▶ Confirm your entries with the **Next (Enter)** button (see Figure 5.7, Step 3).

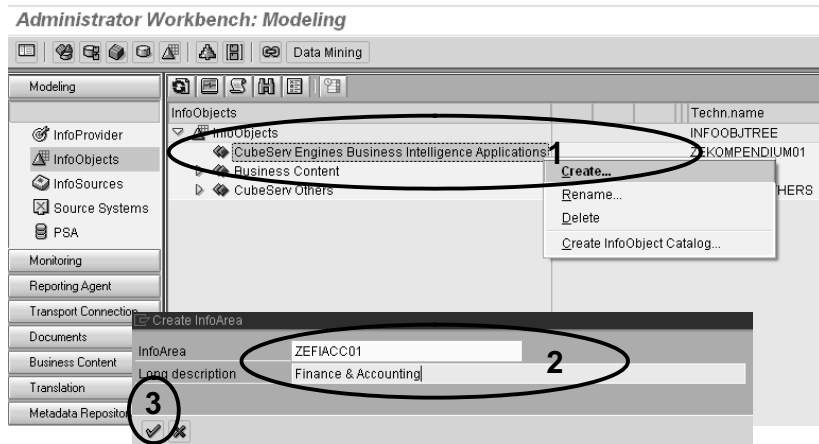


Figure 5.7 Creating Subordinate InfoAreas

Proceed similarly until you have created the desired InfoArea hierarchy (see Figure 5.8).

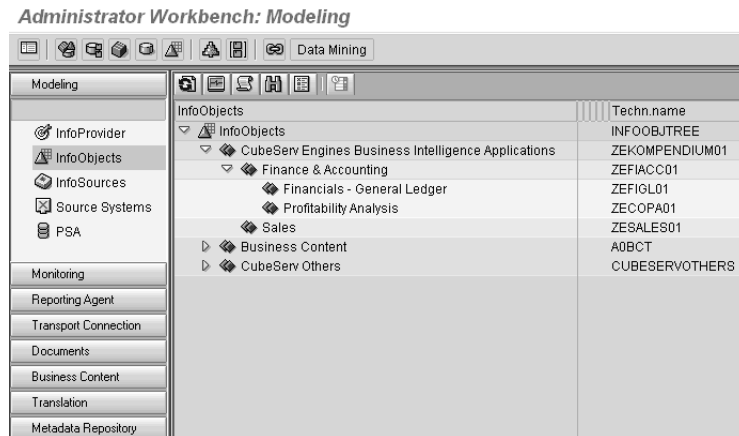


Figure 5.8 InfoArea Hierarchy

5.1.3 Setting Up InfoObjectCatalogs

Based on the InfoArea hierarchy, you set up the required InfoObjectCatalogs in the **InfoObjects** view of the Administrator Workbench of SAP BW.

Setting Up an InfoObjectCatalog for Characteristics



- ▶ To create an InfoObjectCatalog, select the InfoArea to be assigned to the catalog in the **InfoObjects** view of the Administrator Workbench (see Figure 5.9, Step 1).
- ▶ Right-click to open the context menu. Then click to select the menu entry **Create InfoObjectCatalog...** (see Figure 5.9, Step 2).
- ▶ In the **Edit InfoObjectCatalog** popup, enter the name and a description of the InfoObjectCatalog (see Figure 5.10, Step 1).
- ▶ You can retain the default setting **Characteristic** (see Figure 5.10, Step 2).
- ▶ Click on the **Create** button to create the InfoObjectCatalog (see Figure 5.10, Step 3).

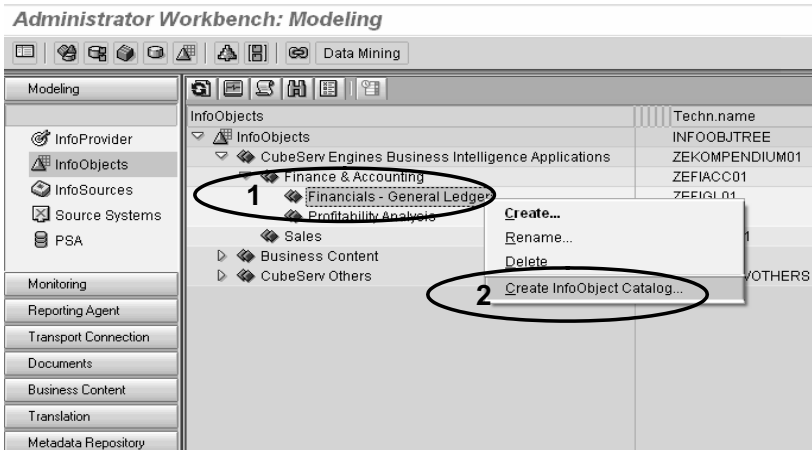


Figure 5.9 Creating an InfoObjectCatalog

- ▶ You can activate the object in the **Edit InfoObjectCatalog** dialog (see Figure 5.11, Step 1).
- ▶ Return to the **InfoObjects** view of the SAP BW Administrator Workbench with the **Back** button (see Figure 5.11, Step 2), which will display the catalog beneath the InfoArea (see Figure 5.11, Step 3).

Activating the object

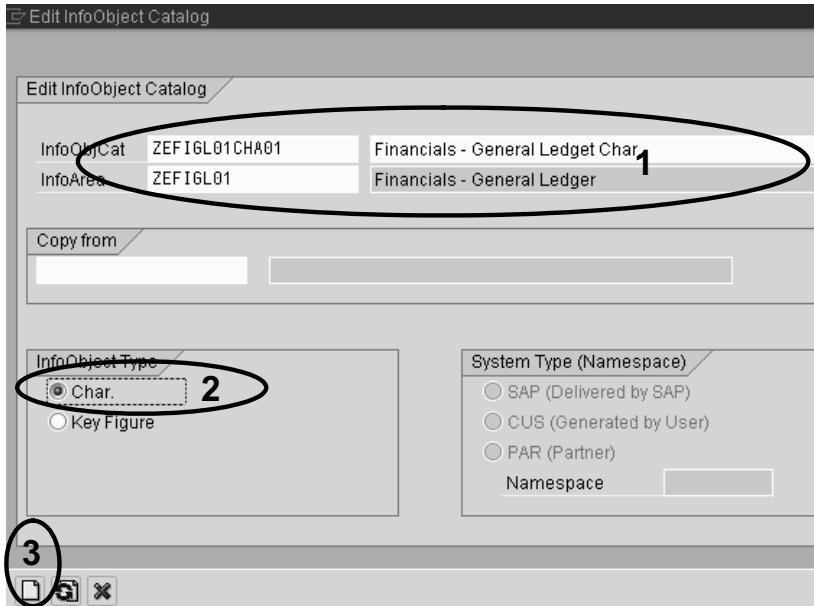


Figure 5.10 Entering the Technical Name, Description, and the "Characteristic" Type

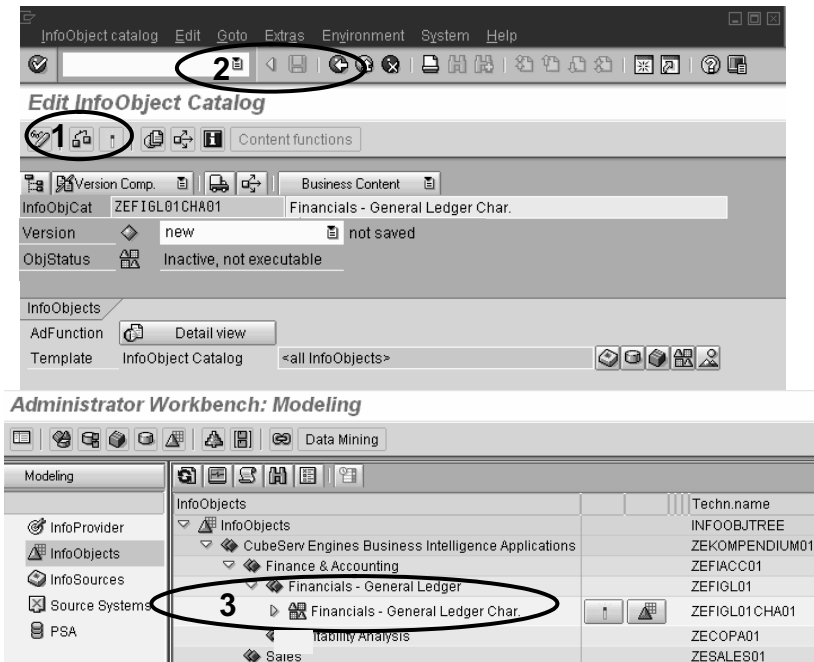


Figure 5.11 Activating the Characteristics InfoObjectCatalog and Display in the InfoObjects View of the Administrator Workbench

Setting up an InfoObjectCatalog for Key Figures

The creation of an InfoObjectCatalog for key figures is similar to the creation of InfoObjectCatalogs for characteristics (see Figure 5.12, Step 1 and Step 2). The only modification is the selection of the **Key Figure** type in the **Edit InfoObjectCatalog** popup (see Figure 5.12, Step 2).

Proceed accordingly until you have created all the required InfoObjectCatalogs for the desired InfoAreas (see Figure 5.13).

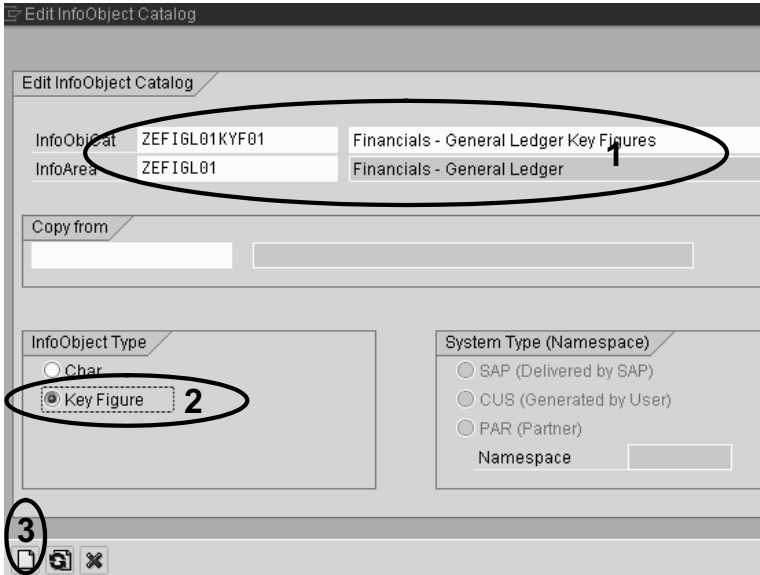


Figure 5.12 Entering the Technical Name, Description, and the "Key Figure" Type

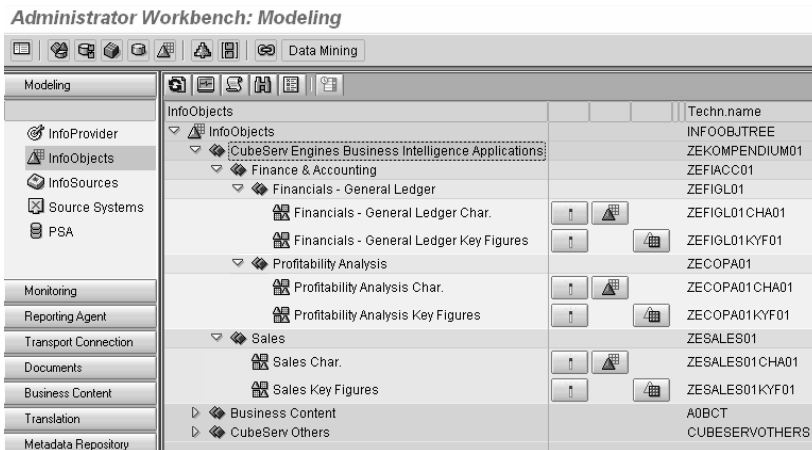


Figure 5.13 InfoAreas and InfoObjectCatalogs

5.2 InfoObjects of SAP Business Content

Object versions SAP Business Content provides objects for direct use. As explained extensively in Section 2.7, SAP Business Content involves preconfigured, role- and task-related information models based on consistent metadata in SAP BW. SAP Business Content contains all the components necessary for an analytical application.¹

Excursus

Activating the objects of SAP Business Content

The objects provided in SAP Business Content are available in a D(elivery) version. Activation of these objects converts them into an A(ctive) version (see Table 5.1). Note that SAP also generates an intermediate M(odified) version that remains in the event of a termination.

If you want to activate SAP Business Content, you should note that its objects are changed from the D version to an M version and then to the A version (see Figure 5.14).

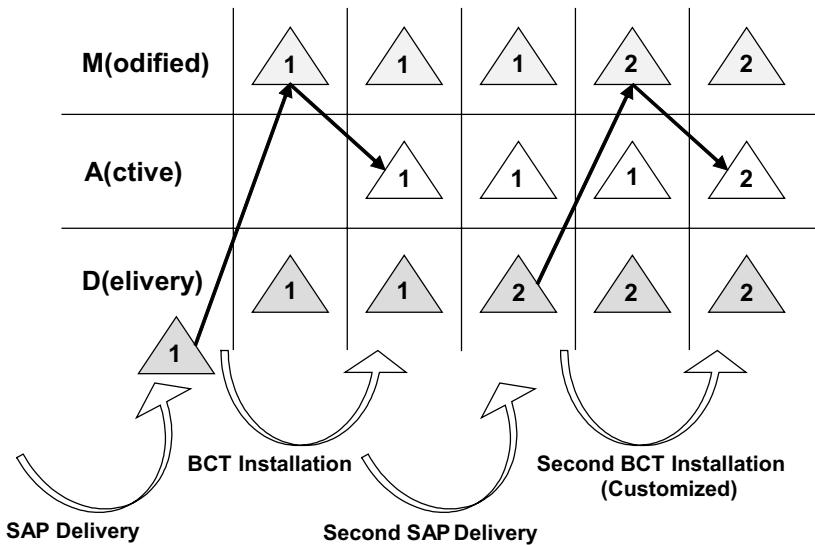


Figure 5.14 Object Versions During the Activation of SAP Business Content (Source: <http://help.sap.com>)

¹ See Chapter 7 for additional notes and suggestions on using and working with SAP Business Content.

5.2.1 Activating an Individual InfoObject of SAP Business Content

The InfoObjects of SAP Business Content that can be used are made available by selective or comprehensive activation of SAP Business Content. The following sections examine both variants in more detail.

Grouping with SAP Business Content Activation

- ▶ First change to the **Business Content** view of the Administrator Workbench (Transaction RSA1: see Figure 5.17, Step 1).
- ▶ Ensure that the grouping setting corresponds to the proper procedure. You can use the **Grouping** button to choose among the following variants (see Figure 5.17, Step 2):
 - ▶ **Only Necessary Objects**
This variant activates only the dependent objects of SAP Business Content required for successful activation of the selected objects.
 - ▶ **In Data Flow Before**
This variant activates all the dependent objects of SAP Business Content required for successful activation of the selected objects and those that deliver data to a collected object (see Figure 5.15).

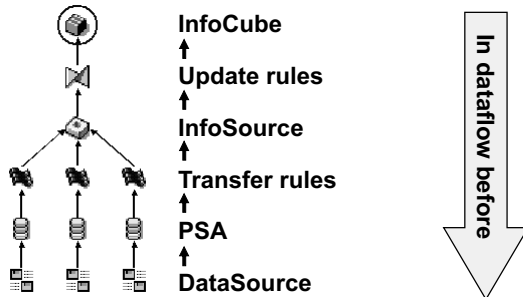


Figure 5.15 In Data Flow Before (Source: <http://help.sap.com>)

- ▶ **In Data Flow Afterwards**
This variant activates all the dependent objects of SAP Business Content required for successful activation of the selected objects and those received from a collected object (see Figure 5.16).

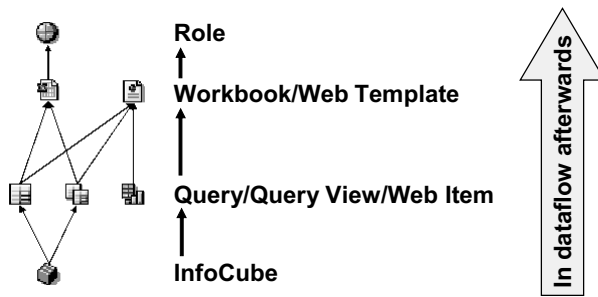


Figure 5.16 In Data Flow Afterwards (Source: <http://help.sap.com>)

► **In Data Flow Before and Afterwards**

This variant activates all the dependent objects of SAP Business Content required for successful activation of the selected objects, those that deliver data to a collected object, and objects that receive data from a collected object.



- For a minimal activation, select the **Only Necessary Objects** group-when activating SAP Business Content.
- A selective activation (characteristics with their data retrieval, for example) ideally occurs with the **In Data Flow Before** option.
- You can use **In Data Flow Before and Afterwards** for comprehensive activations.

Selecting InfoObjects



- After setting the desired grouping, double-click in the navigation window on the selection level (see Figure 5.17, Step 3): **Object Types** in our example.
- **All Objects According to Type** is available for selection in the central frame (Step 4).
- Open the **InfoObject** folder in this frame. The **Select Objects** entry is displayed (if SAP Business Content has been activated and the objects are inserted in your personal list of values, InfoObjects might be listed under the **Select Objects** entry).
- You can then double-click on the **Select Objects** entry to begin the selection (Step 5).
- The **Input Help for Metadata** provides the InfoObjects for selection, sorted alphabetically by technical name (Step 6).

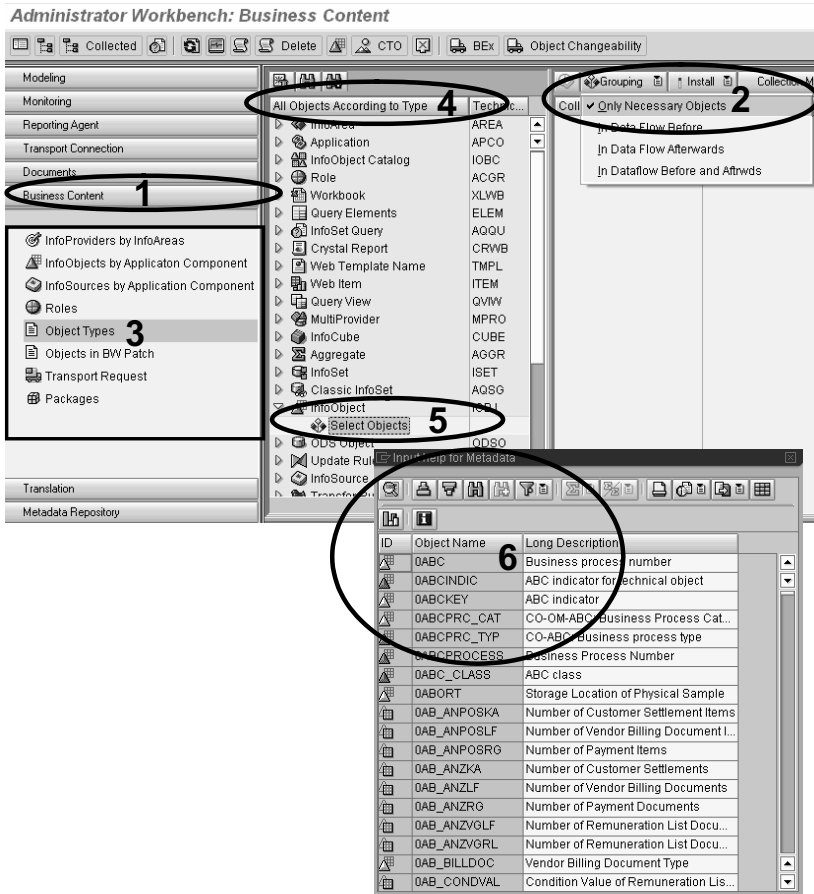


Figure 5.17 Selecting SAP Business Content InfoObjects, Part 1

- ▶ To make a specific selection, simply select the **Object Name** column in the popup (see Figure 5.18, Step 1) and click on the **Filter** button (see Figure 5.18, Step 2).
- ▶ In the **Determine Values for Filter Criteria** popup, you can specify your desired selection (one or more InfoObjects, generic selection, or lists of InfoObjects): in our example the InfoObject 0VERSION is specified (Step 3).
- ▶ After you confirm your selection (Step 4), the InfoObject you selected is displayed in the **Determine Values for Filter Criteria** popup.
- ▶ When you click to mark an object in the corresponding line of the list of values (Step 5) and select the **Copy Selection** button (Step 6), the process of collecting the required objects begins according to the grouping option.

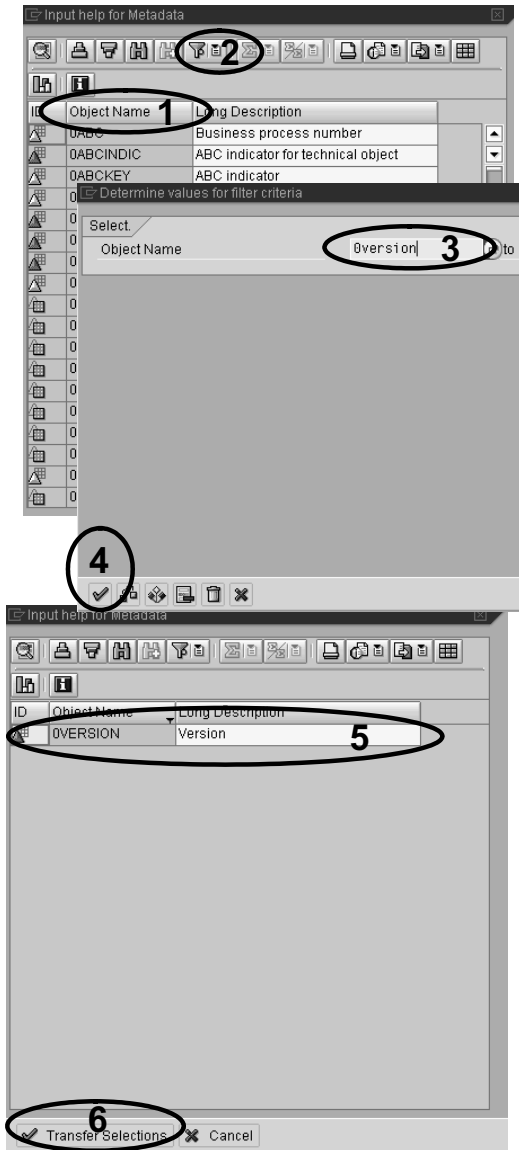


Figure 5.18 Selecting SAP Business Content InfoObjects, Part 2

Activating Objects of SAP Business Content



- ▶ At the end of the collection process (our example uses the grouping option **Only Necessary Objects**), the collected objects are displayed in the **Collected Objects** frame (see Figure 5.19, Step 1).
- ▶ The activation process begins when you click on the **Install** button (see Figure 5.19, Step 2).

Administrator Workbench: Business Content

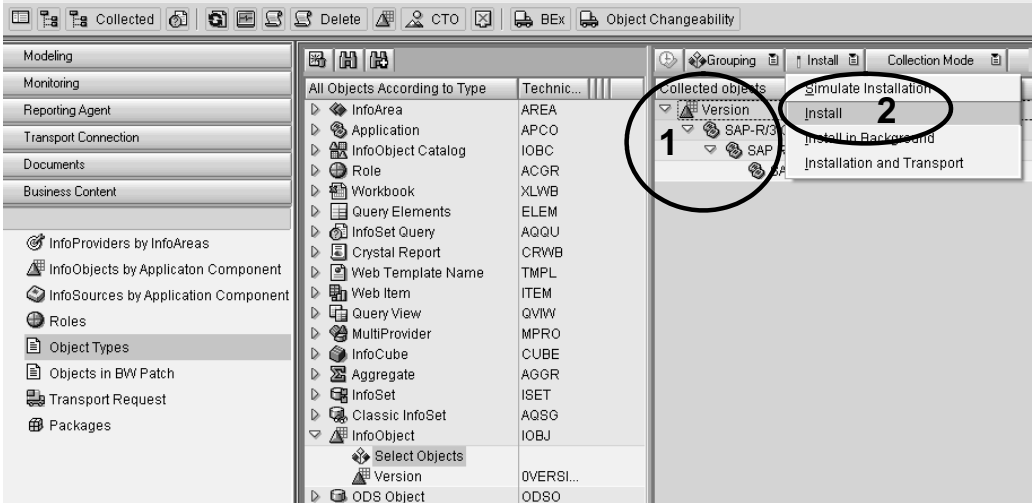


Figure 5.19 Activating SAP Business Content InfoObjects

When the activation ends, two frames display a log of the results (see Figure 5.20). If the log entries have a green information icon, no further steps are necessary. The InfoObject is available for work with SAP BW.

Administrator Workbench: Business Content

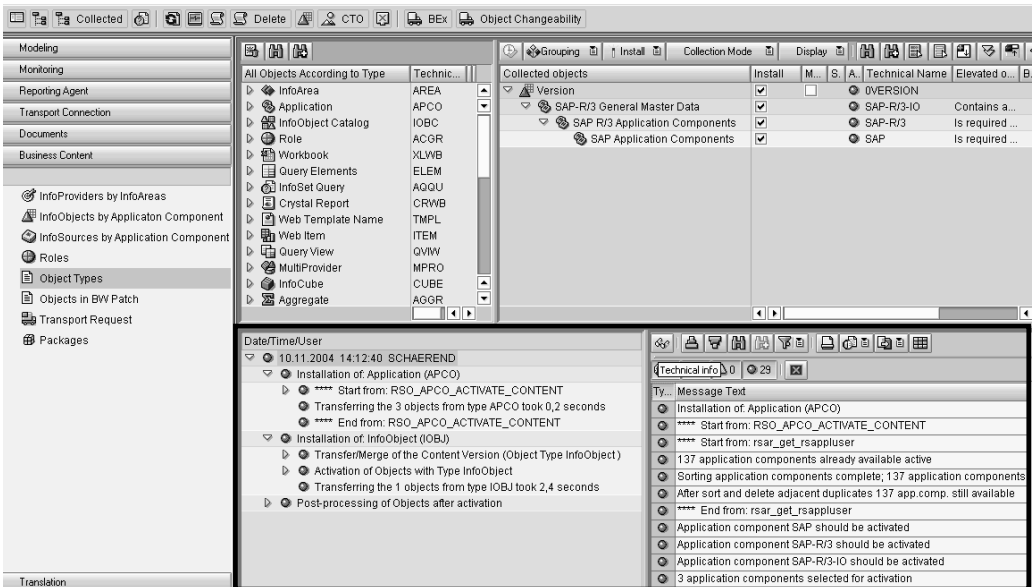


Figure 5.20 Results Log of SAP Business Content Activation

5.2.2 Transferring an SAP Business Content InfoObject into an InfoObjectCatalog

Activated InfoObjects are available in the **InfoObjects** view of the SAP BW **Administrator Workbench**. As noted earlier, you should group the InfoObjects into InfoObjectCatalogs.

Editing InfoObjectCatalogs



- ▶ To do so, open the InfoObjectCatalog for modifications by double-clicking on it (see Figure 5.21). Alternatively, you can open the context menu with a right-click and select the **Change** entry.
- ▶ You can search for the desired object in the **Edit InfoObjectCatalog** dialog (or by using the **Search** button: see Figure 5.22, Step 1).

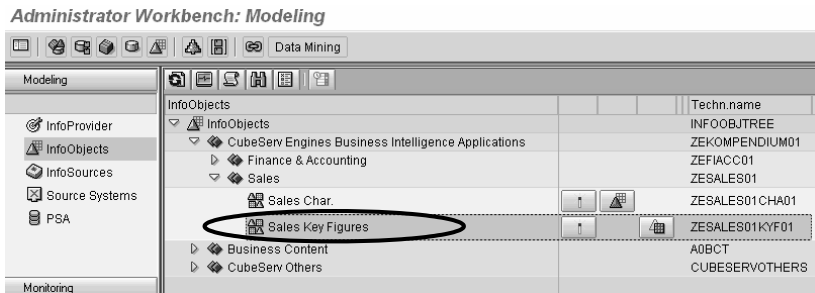


Figure 5.21 Selecting an InfoObjectCatalog for Editing

Transferring an InfoObject into an InfoObjectCatalog



- ▶ After you have highlighted the desired object (see Figure 5.22, Step 2), it is included in the InfoObjectCatalog when you click on the **Transfer Fields** button (see Figure 5.22, Step 3).
- ▶ The transferred object is highlighted in color and listed in the **Structure** (see Figure 5.23, Step 1 and Step 2).
- ▶ After activation (see Figure 5.23, Step 3), the InfoObject is displayed in the Administrator Workbench as a component of the InfoObjectCatalog (see Figure 5.23, Step 4).

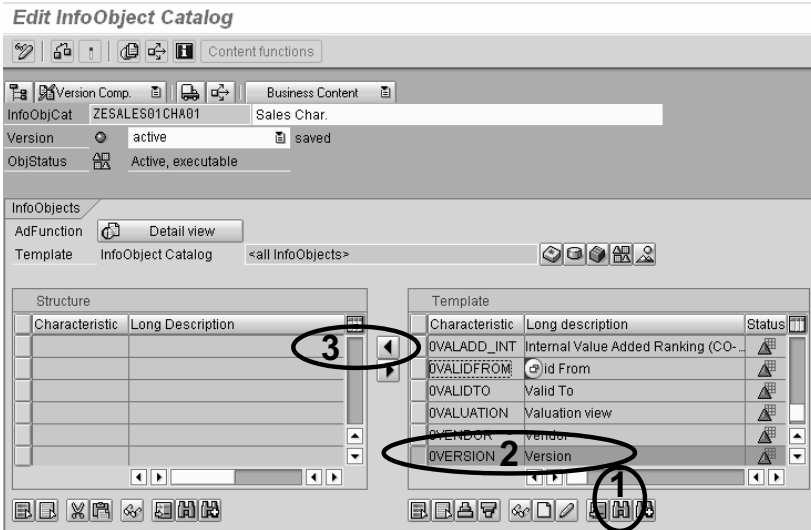


Figure 5.22 Selecting an InfoObject for Transfer into the InfoObjectCatalog

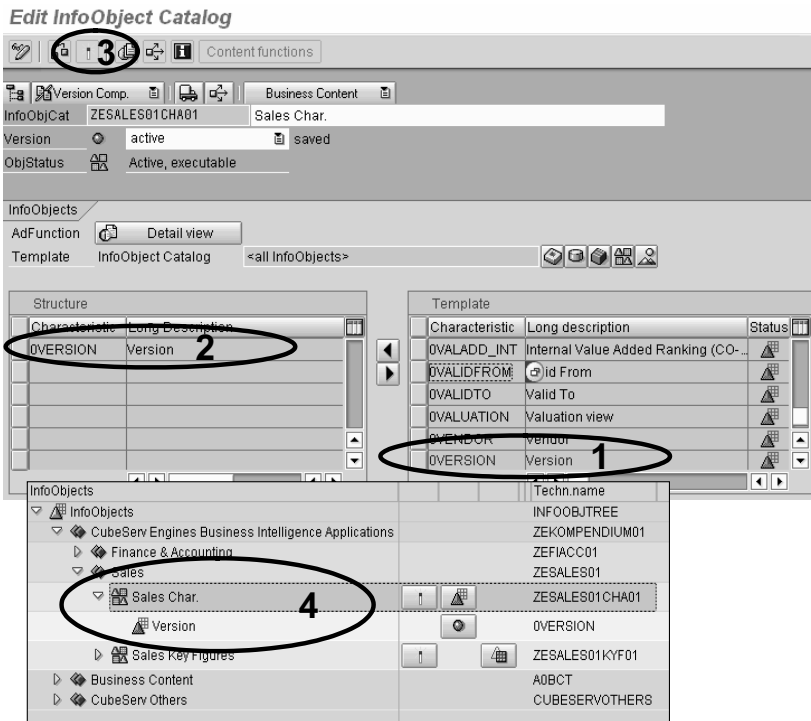


Figure 5.23 Results of the Transfer and Activation of the InfoObject in the InfoObject-Catalog

5.2.3 Transferring an SAP Business Content InfoObject In Data Flow Before

SAP Business Content offers more than ample coverage for InfoObjects (characteristics and key figures). It also meets most requirements for data retrieval (master data, texts, and hierarchies) for characteristics. That's why we recommend that you also activate **In Data Flow Before** when you transfer characteristics.

Procedure and Results of the In Data Flow Before Activation



- ▶ To activate SAP Business Content In Data Flow Before, first set the groupingGgrouping option to **In Data Flow Before** (see Figure 5.24, Step 1).
- ▶ Then select (as indicated above: see Figures 5.17 and 5.18) the SAP Business Content InfoObjects to be activated (see Figure 5.24, Step 2).
- ▶ For the selected objects, the related and required objects (compoundings and attributes, for example) and the elements of the upstream ETL (Extraction, Transfer, and Loading) process (transfer structures, transfer rules, InfoPackages, and so on) are then collected.
- ▶ After you click on the **Install** button (see Figure 5.19 and the related comments), all objects are available for further work in SAP BW provided they were activated without errors.

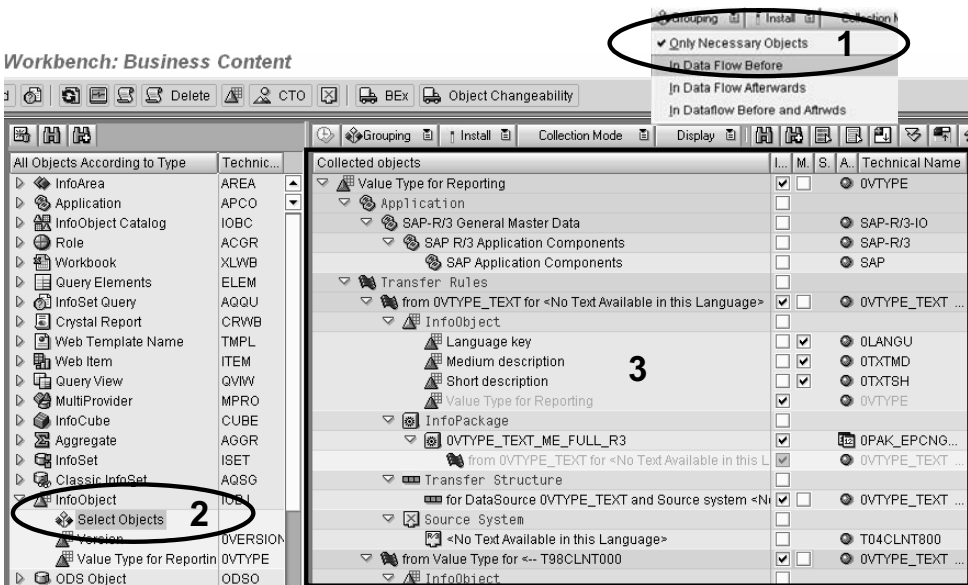


Figure 5.24 Collecting Objects In Data Flow Before

If errors occurred during the activation of SAP Business Content (see Figure 5.25, Steps 1 and 2), you must deal with them systematically. In our example, the key field is missing in the transfer structure.²

Errors when activating SAP Business Content

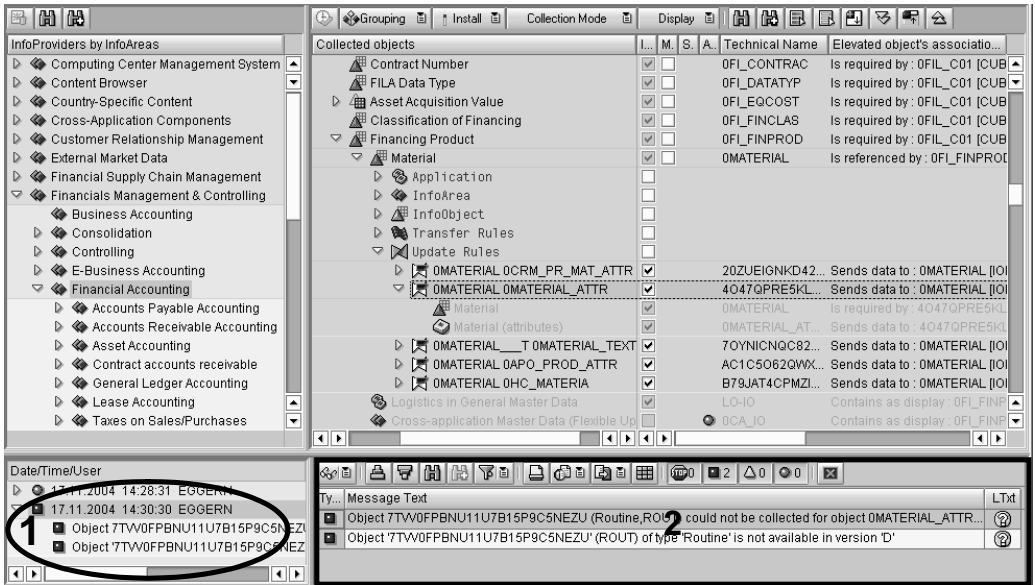


Figure 5.25 Errors When Activating SAP Business Content

5.2.4 Transferring SAP Business Content InfoObjects by Selecting InfoCubes In Data Flow Before

In general, the effort involved in step-by-step activation is too great. That's why you can analyze SAP Business Content and activate targeted InfoCubes with the grouping option **In Data Flow Before** to make the InfoObjects available to an analytical application. In our model company, CubeServ Engines, we want to implement Financial Reporting (general ledger with profitability analysis and balance sheet). To do so, we select InfoCubes OFIGL_*

Activation to collect Info Objects

Selecting SAP Business Content InfoCubes

- ▶ To do so, proceed as you did with the selection of InfoObjects. Simply select the InfoCubes that you want in the InfoCube folder of the **All Objects According to Type** frame by opening the InfoCube folder with



² See Volume 2 of the SAP BW Library (forthcoming). Egger et al.: *SAP BW Data Retrieval*. SAP PRESS, 2005.

a click. Double-click on the **Select Objects** entry to start the selection (see Figure 5.26, Step 1).

- ▶ Select the InfoCubes in the **Input Help for Metadata** popup. You can also use filtering to simplify the selection (see Figures 5.17 and 5.18).

Selecting Multiple Entries from the Input Help

You can use one of two methods to select multiple entries from the Input Help:



- ▶ In **option 1**, to select several separate entries, click on the first entry, hold the **Ctrl** key, and then click on all the other entries you want.
- ▶ In **option 2**, to select a coherent interval of entries, click on the first entry of the interval, hold the **Shift** and **Ctrl** keys, and then select the last entry of the interval. The example selects the interval of all InfoCubes from OFIGL_C01 to OFIGL_VC2 (see Figure 5.26, Step 2).

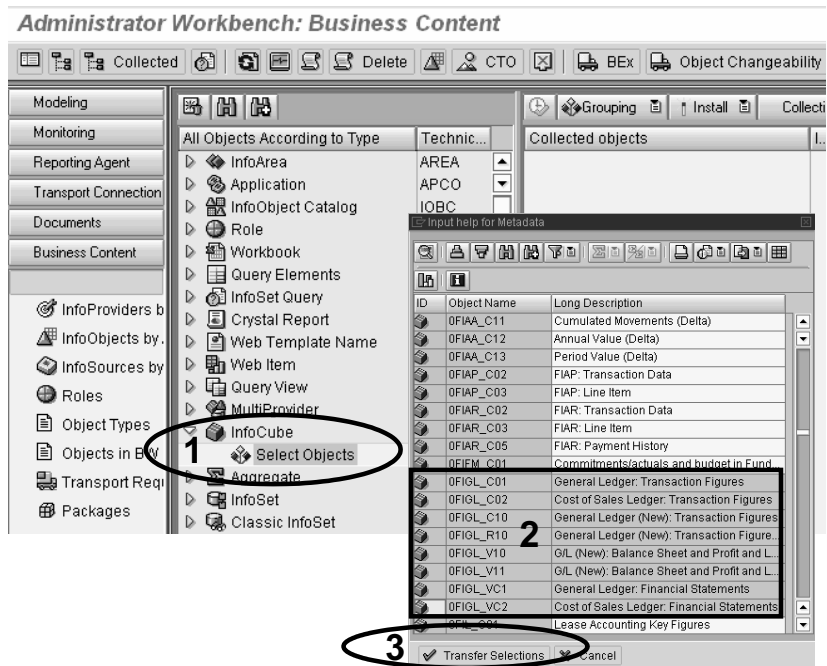


Figure 5.26 Collecting InfoObjects via InfoCubes

- ▶ After you click the **Transfer Selections** button (Step 3), SAP BW starts to collect all the related InfoObjects and ETL components. See the comments above on the activation of individual InfoObjects **In Data Flow Before**.

Merging the Active Version and the Content Version

In some circumstances, portions of the SAP Business Content that you want to activate are already active. In this case, the system merges the active version with the content version.

- ▶ In our example, the system first requests confirmation to overwrite the transfer routine for InfoObject OSOURSYSTEM.
- ▶ After you confirm the query (see Figure 5.27, Step 1), a **Merge InfoObject...** dialog offers you an option to overwrite all transfer routines with the Content version without further queries. To do so, simply click on the **Transfer All Without Dialog** button (Step 2).

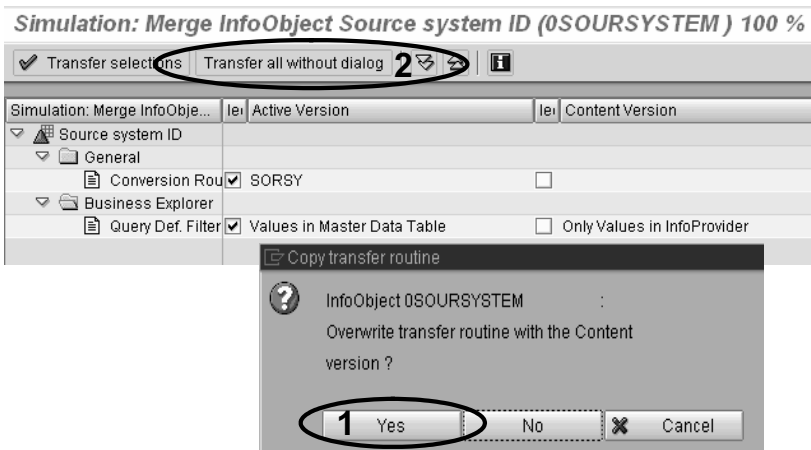


Figure 5.27 Query: Overwrite the Active Version with the SAP Business Content Version

With the initial activation of SAP Business Content in several steps, the option to overwrite the active versions without dialog (i.e., without further queries) is usually doable. However, if you've made customizing settings (and especially if productive analytical applications already exist in SAP BW), you should use this option only with great caution.



5.2.5 Simultaneous Transfer of Several SAP Business Content InfoObjects into an InfoObjectCatalog

After you've activated the InfoCubes and the related InfoObjects, you can assign several InfoObjects to an InfoObjectCatalog in one step. To do so, open an InfoObjectCatalog in the **InfoObjects** view of the **Adminis-**

trator Workbench with a double click (or use the right mouse button and select the **Modify** entry in the context menu of an InfoObjectCatalog) to edit it.

Selecting a Template



- ▶ In the **Edit InfoObjectCatalog** dialog, you can select one of the following buttons to select the type of template:
 - ▶ InfoSource
 - ▶ ODS object
 - ▶ InfoCube
 - ▶ InfoObjectCatalog
 - ▶ All InfoObjects
- ▶ In our example that transfers the InfoObjects available for the model company, CubeServ Engines, select the **InfoCube** type of template by clicking the button with the appropriate icon (see Figure 5.28).

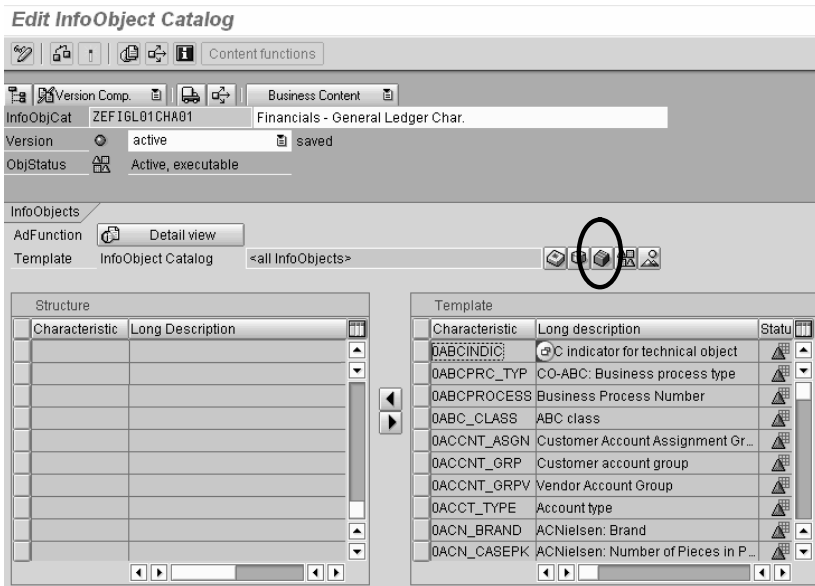


Figure 5.28 Selection of the InfoCube Type of Template to Transfer InfoObjects into the InfoObjectCatalog

- ▶ When you select the InfoCube type of template that you want, the **Select InfoCube** popup appears. Click the **All InfoCubes** button to display a list of all active InfoCubes (see Figure 5.29, Step 1).

- ▶ Double-click (or use a single click and confirm the selection with the **Next (Enter)** button) to make the InfoObjects of the selected InfoCubes available as a template (Step 2). The **Transfer Fields Automatically** popup prompts you to transfer all the InfoObjects of the corresponding catalog type (characteristics or key figures).

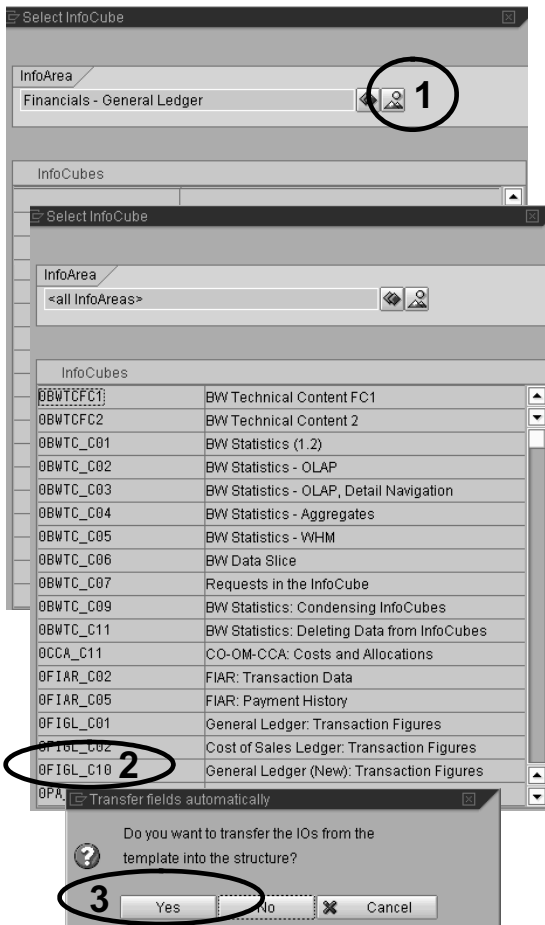


Figure 5.29 Selection of an InfoCube as a Template to Transfer InfoObjects into the InfoObjectCatalog

- ▶ Confirm this option (see Figure 5.29, Step 3) to include all the InfoObjects of the corresponding type in the InfoObjectCatalog automatically (see Figure 5.30, Step 1).
- ▶ If you don't accept this option, you can only transfer the InfoObjects in the **Edit InfoObjectCatalog** dialog into the template (Step 2).
- ▶ Then activate the InfoObjectCatalog (Step 3).

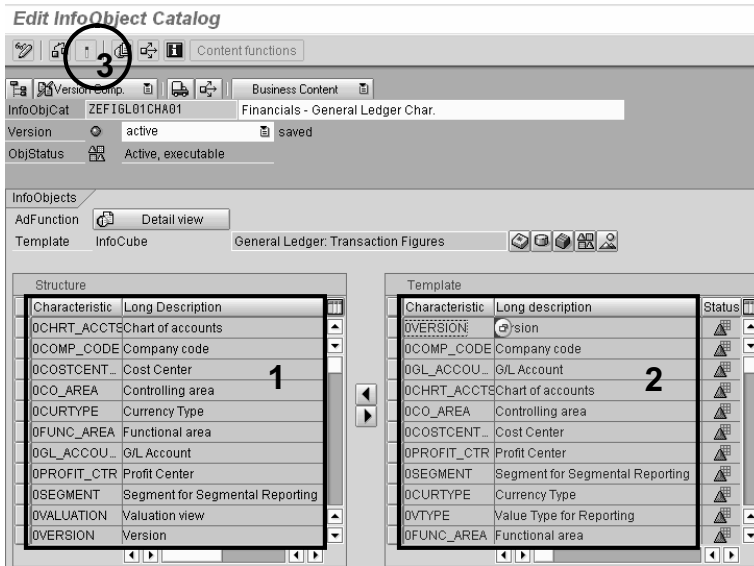


Figure 5.30 Results of the Copy and Activation of the InfoObject

Characteristics and key figures

You can proceed in the same manner for characteristics and key figures (see Figures 5.29 and 5.30). With this procedure, all characteristics are transferred into a characteristics InfoObjectCatalog and all key figures are transferred into a key figures InfoObjectCatalog. Figure 5.31 illustrates the results.

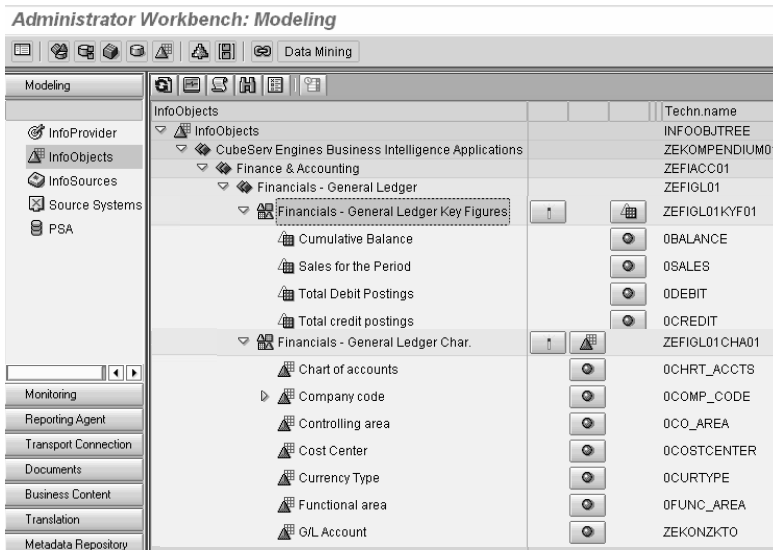


Figure 5.31 InfoObjectCatalogs for Characteristics and Key Figures

Index

A

ABAP/4 coding 77, 79, 84
Account-oriented data model 119
Activating Drag&Drop 137
Activating indices 232
Activation of InfoObject 187
Activation of SAP Business Content
151
Actual data 129, 173, 195, 199, 224, 235,
240, 241, 246, 298
Actual-data InfoCube 129, 211, 220,
240, 241
Addition 79
Ad-hoc analysis 49, 90
Ad-hoc reports 85
Administration 50
Administrative metadata 50
Administrator Workbench 67, 135, 137,
143, 260
Aggregated key figures 126
Aggregates 42
Aggregation 56, 185, 223
Aggregation hierarchies 43
Aggregation layer 43
Aggregation level 57
Aggregation tables 42
ALE 68
Alert monitor 85, 87
Allocation data 265, 270, 271
Allocation InfoCube 269
ALPHA 176, 177
ALPHA conversion 176, 177
Analysis of sales order stocks 274, 276
Analysis tools 47, 81
Analytical applications 124, 134
Application Link Enabling 68
Application-specific InfoObjects 130
Architecture of SAP BW 67
Assigning characteristics 204, 240
Assignment of a constant value 77
Associations 48
Attribute 237, 287, 300
Authorization check 180
Authorization relevant 180
Automatic consistency check 170

B

Backup 50
BAPI interface 82
Basic characteristics 237
Basic InfoCube 292
BasicCube 71, 199, 241
Best-practice OLAP 94
Best-practice solution 74, 99
BEx 81, 90, 178, 189
BEx Analyzer 85, 89, 90, 94, 95, 128
BEx Broadcaster 90, 91
BEx information broadcasting 90
BEx Portfolio 91
BEx query 82, 83, 89, 264
BEx Query Designer 91
BEx Reporting 225
BEx Web analyzer 90
BEx Web Application Designer 91
BEx Web applications 90, 128
Bitmap index 44
Boolean comparison 44
Boolean operators 44
Budget Management 293
Business blueprint phase 98
Business budgeting 49
Business Consolidation 127
Business Content *see* SAP Business
Content 146
Business Explorer queries 89
Business Explorer *see* BEx 189
Business Explorer workbooks 89
Business Information Warehouse *see*
SAP BW 285
Business intelligence applications 121
Business intelligence solutions 124
Business metadata 51
Business planning 49
Business planning and budgeting 49
BW *see* Business Information Ware-
house 285
BW-BPS 241

C

Cardinality 239
Central data warehouse system 45

- Central monitoring 96
 - CHAR 176
 - CHAR InfoObjects 176
 - Characteristic 139, 173, 174, 190, 202
 - Characteristic as data target 190
 - Characteristic hierarchies 124
 - Characteristic is document attribute 178
 - Characteristic properties 176
 - Characteristic without conversion routine 177
 - Characteristic-oriented data model 119
 - Characteristics 55, 63, 88, 97, 129, 218, 260, 266, 268, 270, 276, 286, 289, 294
 - Characteristics InfoObjectCatalog 229
 - Characteristics without conversion 176
 - Chart of accounts 220
 - Chart of accounts properties 158
 - Charts 87
 - Choosing key figures 251
 - Clustering 48
 - Codd, E.F. 24
 - Coded presentation 167
 - Cognos 124
 - Column selection 84
 - Column-oriented data model 119
 - Company code currency 183
 - Company codes 123
 - Company fixed costs 126
 - Compounded attributes 163
 - Compounding 182, 288
 - Comprehensive InfoObjects 130
 - Consistency check 170
 - Consolidation 124, 127
 - Consolidation paths 55
 - Content Version 153
 - Controlling 98, 286
 - Controlling—Profitability Analysis 127, 223
 - Conversion routine 176, 177
 - Cost center reporting 293
 - Create MultiProvider 216
 - Creating an InfoObject 174
 - Creating dimensions 221
 - Creating your own InfoObjects 172
 - Credit Management 293
 - CRM 293, 302
 - Crystal Reports 124
 - Cube 52, 55, 57, 59
 - Cumulative value 182, 183, 185, 282
 - Currency conversion 183
 - Customer exit 84
 - Customer orders 129
 - Customer Relationship Management *see* CRM 293
 - Customer-specific InfoObjects 183
 - Customer-specific ODS object 198
- D**
- Data acquisition 38, 50, 75
 - Data acquisition layer 37
 - Data acquisition process 75
 - Data auditing tools 40
 - Data capture 49
 - Data cleansing 38, 40
 - Data copy 38, 41
 - Data cube 54
 - Data distribution 49
 - Data export 96
 - Data fields 231
 - Data mart systems 41
 - Data marts 46, 47, 96, 291
 - Data mining 49
 - Data mining tools 48
 - Data model 54, 223, 286, 287, 292, 294
 - Data modeling 74, 121, 128
 - Data presentation 96
 - Data presentation layer 37
 - Data providers 86
 - Data provision 47
 - Data retrieval 121
 - Data sources
 - database systems 75
 - non-SAP systems 75
 - SAP Systems 75
 - structured interface files 75
 - XML data 75
 - Data storage 41, 96
 - Data storage layer 37
 - Data target 190
 - Data type 174
 - Data warehouse 37, 42, 57, 169, 291
 - Data warehouse architecture 34
 - Data warehouse design 30

- Data warehouse environment 25, 37
- Data warehouse layer 291
- Data warehouse solution 94
- Data warehouse system 42, 45
- Data warehousing 28
- Data warehousing product 285
- Database tables 96
- Databases 24
- Dataflow 223
- DataProvider 286
- DataSource 76, 173, 181, 224
- DataSources
 - Business Content 76
- DB for OLAP interface 82
- Dedicated inventory key figures 183
- Default InfoObjectCatalog 133
- Define Dimensions 213
- Deleting Dimensions 213
- Deliveries 125
- Delta load 38
- Delta upload 79
- Delta-extract mode 96
- Design criterium 289
- Developed star schema 62, 65
- Dicing 58, 59
- Dimension hierarchy 55, 61
- Dimension tables 61, 289, 415
- Dimensions 55, 56, 57, 61, 63, 199, 239, 240, 246, 268, 270, 278, 289, 415
- Direct transfer 77, 79
- Display attributes 64
- Display of decimal places 167
- Distributed data warehouse system 45
- Document attribute 178
- Document characteristics 236, 237
- Document level 256
- Document ODS object 227
- Document tables 183
- Drag&drop 136, 230
- Drag&Relate 170
- Drill across 60
- Drill down 60
- Drill through 60
- Dropdown boxes 87
- DSS 27
- DWH 24, 41
- DWH environment 35

E

- Edit MultiProvider 218
- EIS 28, 48
- EIS tools 48
- End applications 37
- Enterprise Controlling—Consolidation 127
- Enterprise data warehouse 96
- ERP software 24
- ETL 38, 127, 169, 253
- ETL components 253
- ETL process 39, 67, 76, 80, 169, 196, 226
- ETL processes 50
- Excel 89
- Excel workbooks 89
- Exception analysis 92
- Exception reporting 92
- Exceptions 81, 92
- Excursus 142
- Executive information systems 48
- Export DataSource 181
- Extraction 39, 46, 223, 286, 303
- Extraction methods 127
- Extraction mode 96

F

- Fact table 55, 61, 415
- FI 293
- Filter selection 180
- Filtering 38
- Finance & Accounting 98, 134
- Financial Accounting 286, 295
- Financial Accounting—General Ledger Accounting 127
- Financial reporting 124, 126, 129, 192, 223
- Financial Reporting MultiProvider 223
- Financials 134, 293
- Fiscal dimension 123
- Fiscal posting periods 124
- Fiscal year variant 123, 263
- Flat file 96, 298
- Flat file upload 298
- Flow logic 84
- Forecasting 49
- Formula variables 84
- Formulas 77, 79

- For-period 302
- Front-end tool 82
- Frontends 94
- Full costs of manufacturing 126
- Full load 38
- Full upload 79
- Full-extract mode 96
- Fuzzy logic 48

G

- General ledger 124
- General Ledger Accounting 127
- Goods movements 298
- Granularity 56, 57, 126, 129, 241, 244, 252, 292
- Group currency 183

H

- Header data 258, 265, 266, 271
- Header data InfoCube 265
- Hierarchy 84, 124, 181, 237
- Hierarchy node variables 84
- Hierarchy table 64
- Hierarchy variables 84
- High cardinality 239
- High granularity 244
- HOLAP 51
- HR 293
- HR reporting 131
- HTML 92
 - standard functionality 85
- HTML browser 95
- HTML technology 85
- Hub 96
- Human Resources 286, 293, 300
- Hybrid OLAP 51, 53
- HyperCube 54
- Hyperion 124

I

- Identification 219
- Implementation project 302
- Implementation steps 131
- Impressible summation 167
- In dataflow afterwards 143
- In dataflow before 143, 150, 151
- In dataflow before and afterwards 144
- Incoming-Order InfoCubes 271
- Incoming-Order MultiProvider 271
- Incoming-Order Reporting 252, 254, 265
- Incremental load 38
- Indexing scheme 44
- Indices 232
- Industry Solutions 293, 295
- InfoArea 133, 135, 224
- InfoArea creation 135
- InfoArea hierarchy 138
- InfoCube 63, 71, 96, 97, 127, 128, 151, 154, 189, 199, 209, 219, 223, 241, 252, 267, 286, 289, 297, 413
 - aggregate 74
 - InfoCube structure 213, 245
- InfoObject 78, 96, 127, 128, 129, 133, 135, 142, 158, 175, 183, 189, 197, 225, 235, 274, 286, 287, 292
 - general ledger account 157
- InfoObject creation 178
- InfoObject selection 226, 236
- InfoObject types 293
- InfoObjectCatalogs 130, 133, 139, 148, 153, 197, 224, 228
- InfoObjects of SAP Business Content 142, 145
- InfoPackages 79
- InfoProvider 78, 83, 128, 135, 173, 189, 252, 260, 292
 - RemoteCube 74
 - SAP RemoteCube 73
 - virtual InfoCube 74
- InfoProvider types 189
- Information broadcasting 90
- InfoSets 71, 128, 189, 260, 413
- InfoSource 77, 299
- InfoSpoke 96
- Initial load 39
- In-period 302
- Integration 31
- Integrity constraints 41
- Interval variables 84
- Inventory changes 186
- Inventory key figure 186, 187
- Inventory parameters 279, 280
- Inventory values 182, 281
- Invoice item 183
- Invoices 125

IT systems 124
Item 263
Item data 262, 265, 268, 271
Item data InfoCube 267
Item type 214
ITS 88
iView 92

J

Java Script 85
Join 262
Join conditions 264
Join index 44
Join operations 62

K

Key fields 227, 228
Key figure hierarchies 124
Key figure structures 88
Key figure-oriented data model 119
Key figures 61, 88, 97, 127, 129, 141,
166, 182, 221, 223, 230, 240, 251, 268,
270, 275, 276, 286, 415
Key value 169

L

Layers 43
Line Items 209, 239, 269, 275
Line-Item characteristic 239
Line-Item Setting 209
Line-Item table 228
Load 38, 41
Log files 39
Logical architecture 35
Logistic extract structure customizing
cockpit 128
Logistics 131, 286
Logs 39
Lowercase letters 174

M

Machine learning 48
Main Material Group 237
Management information systems 48
Management reporting 125, 126
Maps 87
Master data 63, 289
Master data maintenance 180

Master data query 191
Master data reporting 189
Material 295
Materialized aggregates 65
Materialized views 41, 42
Matrix 58
Measures 54
Metadata 50, 152, 285
Metadata management 38
Metadata repository 37, 50, 51
Microsoft Excel 89, 95, 124
MIS 26, 48
MIS tools 48
Model 301
Modeling 190, 208
MOLAP 51
Monitor 79
Monitor programs 39
Monitoring 50, 67, 80, 96
Multidimensional analysis tools 47
Multidimensional data model 54
Multidimensional data sets 58
Multidimensional OLAP 51
MultiProvider 71, 128, 173, 189, 216,
221, 223, 246, 271, 286, 290, 295, 413

N

Navigation 58, 287
Navigation attributes 64, 164, 199, 218,
230, 237, 244, 248, 258, 265, 267
Navigation components 85
Navigational attribute 269
Navigational states 86
Net revenue 125
Non-SAP source system
connections 68
Non-volatile 33
Non-volatility 33
NUMC 176
NUMC InfoObjects 176

O

Object type 98
ODS 41, 154, 223, 224, 286, 291
ODS object 79, 154, 189, 195, 223, 224,
228, 232, 252, 291
ODS object template 240
ODS objects 96, 97, 129, 286

- ODS tables 41
- ODS-Layer 128
- OLAP 23, 41, 47
- OLAP Analyses 271
- OLAP design 48, 51
- OLAP functionality 89
- OLAP implementations 58
- OLAP reporting 85, 94
- OLAP technologies 41
- OLE DB for OLAP interface 82
- OLTP 60, 158, 169
- OLTP system 24, 158, 169
- Online analytical processing 47
- Open Hub 67
- Open Hub Service 96
- Open-hub data sources 96
- Open-hub destination 96
- Operating profit 126
- Operational data stores 41
- Operational environment 25
- Operational systems 37
- Operative metadata 50
- Optimization 42
- Optional default values 84
- Order item ODS object 256
- Order items 260
- Organization 55
- Organizational forms 44
- Organizational unit 287, 302
- Overhead Costs Controlling 295
- Overview of components 67
- Overview of orders 256

P

- Parameter variables 84
- Payroll data 302
- Performance improvement 292
- Performance problems 287, 298
- Persistent staging area (PSA) 80
- Physical storage 282
- Plan cost rates 126
- Plan data 126, 129, 173, 210, 241, 246, 298
- Plan prices 126
- Plan Profitability Analysis 241
- Plan-actual comparison 216, 246
- Plan-actual differentiation 173
- Plan-data InfoCube 129, 210, 241

- Planning and simulation 121
- Planning functions 126
- Planning horizon 126
- Planning interface 128
- Planning item 213, 215
- Plug-in 302
- Portals 49
- Preaggregations 42
- Preparation 47
- Presentation 48
- Presentation objects 85
- Presentation tools 37
- Primary key 61
- Product 55
- Product Lifecycle Management 293
- Profit Center 285, 293
- Profit Center Accounting 293, 295
- Profit Center Reporting 285
- Profit margin 125
- Profitability analysis 124, 127, 129, 134, 223, 224, 228, 229, 232, 240, 241, 246
- Profitability analysis MultiProvider 249, 250
- Project costs 287
- Publish and subscribe process 49
- Purchasing data 297

Q

- Qualitative data 54
- Quality assurance 49
- Quantitative data 54
- Queries 86, 90, 91, 295
- Queries in workbooks 89
- Query 47, 190, 223, 301
- Query creation 190
- Query Designer 83, 85
- Query elements 84
- Query execution 183
- Query optimization 41
- Query structures 53
- Query tools 47
- Query views 86

R

- Ranging 58, 59
- Real Estate Management 293
- Realtime data 42
- Recode 173

- Recovery 39
- Referenced InfoObject 159
- Regressions 48
- Relational OLAP 51, 52
- Relational, detailed data layer 43
- Reloading 38, 39
- Remote access 74
- Remote function call 68
- RemoteCubes 71, 189, 413
- Removing key figures 244, 245
- Report tools 47
- Reporting 49, 91, 183, 237, 256, 260, 264, 281, 286, 287, 291, 301
- Reporting agent 81, 85
- Reporting and analysis 121
- Reporting and analysis tools 81
- Reporting at the document level 256
- Reporting Functionality 91, 94
- Reporting objects 91
- Reporting on InfoSets 264
- Reporting tools 128
- Reporting version 181
- Reporting-relevant settings 179
- Reports 285
- Report-to-report interface 170
- Repository 37, 50, 51
- Repository models 51
- Retransferring characteristics 241
- Retransferring document characteristics 236
- Revenue reductions 125, 126
- RFC 68
- ROLAP 51
- ROLAP data structures 53
- Role menu 87, 89
- Rollup 43, 60
- Rotation 58
- Routines 77, 79
- RRI 170
- Runtime environment 88

S

- Sales 134, 299
- Sales & Distribution 124, 125, 127, 252, 299
- Sales document 263, 266, 268, 270, 273
- Sales document (header data) ODS object 254

- Sales document allocation data 270
- Sales document header data 266
- Sales document item 267
- Sales document item data 256, 268
- Sales order items 267, 269
- Sales order stock 183, 274, 278
- Sales orders 265
- Sales-Order-Stock Reporting 252
- Sample Scenario 121
- SAP BEx Analyzer *see* BEx Analyzer 88
- SAP Business Content 97, 98, 127, 133, 142, 146, 172, 192, 253, 285, 288, 293, 300
- SAP Business Content activation 143
- SAP Business Content BasicCube 199
- SAP Business Content Components 192
- SAP Business Content InfoObjects 153, 254, 288
- SAP Business Content Objects 292
- SAP Business Content ODS Objects 195, 253, 254
- SAP Business Explorer 81
 - Ad-hoc queries 88
 - Analyzer 81, 88
 - bookmarks 92
 - calculated key figures 83
 - conditions 85
 - exception 85
 - formulas 83
 - Information broadcasting 81, 90
 - iView 92
 - master data reporting 83
 - mobile reporting 81, 92
 - personalization 91
 - query designer 83
 - reporting agent 92
 - restricted key figures 83
 - structures 83
 - tabular reporting 83
 - URLs specific to SAP BW 87
 - variables 84
 - Web application designer 81, 85
 - Web applications 81, 88
 - Web templates 85
- SAP Business Explorer Analyzer *see* BEx Analyzer 94

- SAP Business Explorer query *see* BEx query 82
- SAP Business Information Warehouse *see* SAP BW 99, 121, 183, 285
- SAP BW 86, 99, 121, 128, 172, 183, 260, 285, 289
- SAP BW 2.0 94
- SAP BW 3.0 94
- SAP BW add-on 88
- SAP BW components 81, 97
- SAP BW Library 121, 131
- SAP BW objects 86, 96
- SAP BW reporting functions 91
- SAP BW role 91
- SAP BW standard functionality 82
- SAP BW system 163
- SAP components 127
- SAP Enterprise Portal 81, 82, 90, 91, 124
- SAP exit 84
- SAP Internet Transaction Server 88
- SAP ITS 88
- SAP NetWeaver 124
- SAP R/3 24, 39, 99, 127, 158, 223, 228, 288, 303
 - core functions 97
- SAP R/3 Basis technology 97
- SAP R/3 document tables 183
- SAP R/3 reporting components 99
- SAP R/3 source system 228
- SAP R/3 upstream system 127, 223
- SAP RemoteCubes 71, 189, 413
- SAP source systems
 - connections 68
- SAP Web Application Server 88
- SAP Web reporting 88
- Scheduling 38, 67, 79
- SCM 293
- SD 299
- Select option variables 84
- Selection 179, 221, 251, 252
- Selection objects 85
- Selection of key figures 251
- SEM 127
- SEM-BCS 127
- SID 64
- SID table 64
- Siebel 24
- Simulation 49
- Single sign-on 92
- Slicing 58
- Snowflake schema 62
- Source system 39, 76, 169, 263, 295
- Source system compounding 169, 170
- Source system groups 169
- Source system ID 254
- SRM 293
- Standard reporting 49
- Standard Web template 85
- Star index 44
- Star schema 61, 62, 289, 300
- Start views 91
- Starting InfoProvider 261
- Stock InfoCube 252
- Strategic Enterprise Management *see* SEM 127
- Strategic Enterprise Management—Business Consolidation *see* SEM-BCS 127
- Style sheets 85
- Substitution paths 84
- Summation 167
- Supplier Relationship Management *see* SRM 293
- Supply Chain Performance Management 293, 295
- Surrogate ID 64
- Surrogate key 63
- System stress 26

T

- Tab 86, 181
- Table JOIN 263
- Technical metadata 50
- Template InfoCube 275, 276
- Template ODS 235, 265, 267, 269
- Text elements 87
- Text table 64
- Text variables 84
- Third-party front-end tools
 - dynaSight 95
 - inSight 95
- Third-party frontend tools 95
 - Business Objects 95
 - Cognos 95
- Third-party reporting tools 82

- Third-party tools 79, 81, 82, 95
- Time 55
- Time characteristics 229, 240, 248, 277, 290, 293, 298
- Time dimension 57
- Time variant 32, 33
- Transactional InfoCube 128, 212
- Transfer rules 77
- Transfer structure 76
- Transformation 38
- Type/Unit 185

U

- Unbalanced hierarchies 63
- Uniformity 32
- Update rules 78
- Upflow 43
- Upstream systems 127, 173

V

- Validity table 280
- Validity table for inventories 280
- Value type 298
- Views 41, 42
- Virtual data warehouse 45
- Virtual InfoCubes 71, 189, 413

W

- Web Application Designer 85, 86
- Web applications 88, 90, 91
- Web browser 85
- Web design API 87
- Web items 86
- Web reporting 88
- Web templates 85, 86, 91
- Webserver 49
- WML 92
- Workbooks 89
- Workflow management 49

X

- XMLA interface 82