Norbert Egger

SAP® BW Professional
Tips and tricks for dealing with SAP
Business Information Warehouse
# Contents

<table>
<thead>
<tr>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>Preface</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td><strong>Part 1 Conceptual Overview</strong></td>
</tr>
<tr>
<td>17</td>
</tr>
<tr>
<td>1 Successful Strategic Information Management</td>
</tr>
<tr>
<td>19</td>
</tr>
<tr>
<td>1.1 Foundations of Management Decision-Making</td>
</tr>
<tr>
<td>19</td>
</tr>
<tr>
<td>1.2 Changed Demands on Information Management</td>
</tr>
<tr>
<td>20</td>
</tr>
<tr>
<td>1.3 Conceptual Foundations</td>
</tr>
<tr>
<td>26</td>
</tr>
<tr>
<td>1.4 Required Enhancements</td>
</tr>
<tr>
<td>29</td>
</tr>
<tr>
<td>1.4.1 Integration of Systems and Applications</td>
</tr>
<tr>
<td>29</td>
</tr>
<tr>
<td>1.4.2 Providing and Distributing Information</td>
</tr>
<tr>
<td>31</td>
</tr>
<tr>
<td>1.4.3 Internal and external data</td>
</tr>
<tr>
<td>33</td>
</tr>
<tr>
<td>1.5 Translating Strategy into Action – The Balanced Scorecard Method of</td>
</tr>
<tr>
<td>Management</td>
</tr>
<tr>
<td>33</td>
</tr>
<tr>
<td>1.6 Successful Implementation and Operation of Business Intelligence</td>
</tr>
<tr>
<td>Solutions</td>
</tr>
<tr>
<td>37</td>
</tr>
<tr>
<td><strong>Part 2 Introduction to SAP BW</strong></td>
</tr>
<tr>
<td>39</td>
</tr>
<tr>
<td>2 SAP Business Information Warehouse—Overview</td>
</tr>
<tr>
<td>41</td>
</tr>
<tr>
<td>2.1 Architecture of SAP BW</td>
</tr>
<tr>
<td>41</td>
</tr>
<tr>
<td>2.2 Storing Data in SAP BW</td>
</tr>
<tr>
<td>42</td>
</tr>
<tr>
<td>2.2.1 InfoObjects as the Foundation</td>
</tr>
<tr>
<td>42</td>
</tr>
<tr>
<td>2.2.2 InfoProviders</td>
</tr>
<tr>
<td>44</td>
</tr>
<tr>
<td>2.3 Data Retrieval</td>
</tr>
<tr>
<td>49</td>
</tr>
<tr>
<td>2.3.1 Components of the Data-Retrieval Process: DataSources</td>
</tr>
<tr>
<td>49</td>
</tr>
<tr>
<td>2.3.2 Components of the Data Retrieval Process: InfoSources</td>
</tr>
<tr>
<td>51</td>
</tr>
</tbody>
</table>
2.3.3 Components of the Data Retrieval Process: Update Rules ....... 52
2.3.4 Components of the Data Retrieval Process: Requesting the Data Transfer and Monitoring .............................. 53
2.3.5 Components of the Data Retrieval Process: Persistent Staging Area (PSA) ........................................... 54
2.3.6 The ETL Process ........................................................................... 54

2.4 Reporting and Analysis Tools ............................................................ 54
2.4.1 SAP BW Components and Third-Party Tools ............................ 54
2.4.2 SAP Business Explorer—Query Designer .............................. 56
2.4.3 Web Application Designer ...................................................... 59
2.4.4 The Runtime Environment of Web Applications ............... 61
2.4.5 SAP Business Explorer Analyzer ............................................ 62
2.4.6 Additional SAP BW Reporting Functions ................................ 63
2.4.7 Reporting Agent ...................................................................... 63
2.4.8 Reporting Functions and Frontends for SAP BW ...................... 64

2.5 Additional Functions and Components .............................................. 65
2.6 SAP Business Content ...................................................................... 66
2.7 The Position of SAP Business Information Warehouse ............... 68

3 Step-by-Step: Profitability Analysis with SAP BW 71

3.1 Introduction ........................................................................................ 71
3.2 Data Modeling .................................................................................... 72
3.2.1 Sample Creation of an InfoObject of Type “Characteristic” ...... 72
3.2.2 Sample Activation of SAP Business Content ............................ 74
3.2.3 Sample Creation of an InfoObject: “Characteristic” Type ........ 79
3.2.4 Creating InfoCubes and a MultiProvider ............................... 83
3.3 Setting Up the Retrieval of Master Data ............................................ 91
3.3.1 General Comments ................................................................. 91
3.3.2 Master Data Texts for the Product Group from Interface Files . 91
3.3.3 Master Data Texts for the Product Main Group from Interface Files ................................................................. 97
3.3.4 Master Data Attributes for the Product Group from Interface Files ............................................................. 97
3.3.5 Master Data Texts and Attributes for Materials from SAP R/3 and Retrieving Data with SAP R/3 DataSource and Interface Files .............................................. 101
3.4 Retrieving Actual Data from SAP R/3 CO-PA ................................ 107
3.4.1 General Comments ................................................................. 107
3.4.2 Setting Up the DataSource in SAP R/3 ................................. 107
3.4.3 Replicating the DataSource in SAP BW .............................. 109
3.4.4 Creating the InfoSource with Transfer Rules ........................ 113
3.4.5 Creating the Update Rules ...................................................... 112
3.4.6 Creating and Executing the InfoPackage for the Actual Data .... 120
3.5 Uploading Plan Data from a File .......................................................... 123
  3.5.1 Creating the InfoSource with a Transfer Structure  
and Transfer Rules for the Plan Data ............................................... 123
  3.5.2 Creating Update Rules for Plan Data ....................................... 126
  3.5.3 Creating and Executing the InfoPackage for Plan Data ............. 127

3.6 Creating an SAP Business Explorer Query ........................................ 129

3.7 Executing the Query ........................................................................
  3.7.1 Executing the Query as a Web Report .................................... 134
  3.7.2 Executing the Query in Microsoft Excel ................................. 139

Part 3  Data Modeling and Data Retrieval 141

4  Data Modeling and Conversion from a 
Column-Oriented InfoSource to an 
Account-Oriented InfoCube 143

  4.1 The Account-Oriented Data Model Versus the 
Column-Oriented Data Model ..................................................... 143
  4.1.1 Problems Associated with the Column-Oriented Data Model .. 143
  4.1.2 The Account-Oriented Data Model ........................................ 146
  4.1.3 Comparing the Data Models ................................................ 147

  4.2 Practical Example: Combination of the Account-Oriented and 
the Column-Oriented Data Model ................................................. 148
  4.2.1 Analyzing the Source Data .................................................... 148
  4.2.2 Data Model ............................................................................ 150

  4.3 Implementation: InfoCubes .......................................................... 151

  4.4 Implementation: Data Retrieval ................................................. 155
  4.4.1 Setting Up the Update Rules for the InfoCube  
"Billing Document" ................................................................. 155
  4.4.2 Setting Up the Update Rules for the InfoCube  
"Order/Project Settlement" ......................................................... 157
  4.4.3 Setting Up the Update Rules for the InfoCube  
"Overhead Costs" ..................................................................... 159

  4.5 Executing Data Retrieval ........................................................... 160

4.6 Performance Optimization and Reporting .......................................... 162

5  Appropriate Mapping of the SAP 
Product Hierarchy in Data Modeling, 
Data Retrieval, and Reporting 167

  5.1 The Material Attribute "Product Hierarchy" in SAP R/3 .................... 167

  5.2 Storing the Material Attribute "Product Hierarchy" in SAP BW  
Using the SAP Business Content Navigation Attribute .................. 169
5.2.1 The SAP Business Content InfoObject "Product Hierarchy" and The Associated Data Retrieval from SAP R/3 .................... 169
5.2.2 The SAP Business Content InfoObject "Material" and the Associated Retrieval of Material Attributes from SAP R/3 .. 171
5.2.3 Problems with Using the SAP Business Content Material Attribute "Product Hierarchy" in Reporting ................ 173

5.3 Storing the Material Attribute "Product Hierarchy" in SAP BW Using the SAP Business Content Hierarchy ..................... 176
5.3.1 Adjusting the SAP Business Content InfoObject "Product Hierarchy" and the Associated Data Retrieval from SAP R/3 .................... 176
5.3.2 Using the Adjusted SAP Business Content Product Hierarchy in Reporting ......................................................... 181

5.4 Solution Using a Step-Based Product Hierarchy as a Material Attribute 184
5.4.1 Creating the DataSource for the Step-Based Product Hierarchy 184
5.4.2 Creating the InfoObjects and Data Targets for the Step-Based Product Hierarchy ....................................................... 186
5.4.3 Setting Up Data Retrieval for the Step-Based Product Hierarchy in SAP BW .......................................................... 188
5.4.4 The Step-Based Product Hierarchy as a Navigation Attribute for Material and Its Use in InfoCubes ............................ 194
5.4.5 Step-Based Product Hierarchy in Reporting ............................. 198

5.5 Advantages and Disadvantages of the Different Variants for Mapping the Product Hierarchy ........................................ 200

Part 4 Reporting and Web Applications with the SAP Business Explorer 203

6 Using Sample Solutions to Show the Important Functions of the Query Designer in SAP BW 3.x 205

6.1 Introduction .................................................. 205
6.1.1 Calling Up the Query Designer and Creating Queries 205
6.1.2 Including Characteristics and Keys in the Query 206
6.1.3 Selections (Restricting) .................................. 207
6.1.4 Saving Queries ........................................... 209
6.1.5 Executing a Query ......................................... 209

6.2 Reusable Objects ........................................ 211
6.2.1 The Concept ............................................. 211
6.2.2 Calculated Keys .......................................... 211
6.2.3 Restricted Keys .......................................... 214
6.2.4 Definition of Calculated and Restricted Keys with Mutual Dependence .......................................................... 216
6.2.5 Structures ................................................. 218

6.3 Properties of Query Elements ............................ 224
6.3.1 Properties of Keys ......................................... 224
6.3.2 Properties of Characteristics and Structural Elements ........... 228
6.4 Hierarchies ........................................................................................................... 232
   6.4.1 Introduction ....................................................................................................... 232
   6.4.2 The Use of Hierarchies in the Query Designer .................................................. 233
6.5 Conditions ............................................................................................................. 238
   6.5.1 The Concept and the Available Types of Conditions in SAP Business Explorer .............................................................. 238
   6.5.2 The Use of Conditions in SAP Business Explorer .............................................. 239
6.6 Exceptions ............................................................................................................. 243
   6.6.1 Visualization of Exception States ....................................................................... 243
   6.6.2 The Use of Exceptions in SAP Business Explorer .............................................. 243
6.7 Variables .............................................................................................................. 245
   6.7.1 Introduction ....................................................................................................... 245
   6.7.2 Characteristic Variables ..................................................................................... 246
   6.7.3 Hierarchy Variables ............................................................................................ 252
   6.7.4 Hierarchy Node Variables ................................................................................... 254
   6.7.5 Text Variables .................................................................................................... 257
   6.7.6 Formula Variables .............................................................................................. 259
6.8 Additional Selected Innovations in the Query Designer ........................................ 262
   6.8.1 Query Characteristics .......................................................................................... 262
   6.8.2 Document Links ................................................................................................ 264
   6.8.3 Calculating with Cells Using the Example "Structure Percent" ......................... 265
   6.8.4 Tabular Reporting Using the Example of Main Data Reporting ....................... 268
7 Selected Functions of the SAP BW Web Application Designer in SAP BW 3.x .... 275
7.1 The Web Application Designer in the Framework of the SAP Business Explorer Components ......................................................... 275
7.2 The Functionality of the Web Application Designer: Overview ......................................................... 277
   7.2.1 Introduction ....................................................................................................... 277
   7.2.2 Web Items ......................................................................................................... 277
   7.2.3 Formatting ......................................................................................................... 281
7.3 First Steps in the Web Application Designer ............................................................ 282
   7.3.1 Starting the Web Application Designer ................................................................. 282
   7.3.2 Creation of a Web Template Using the Web Application Wizard ................... 282
7.4 Web Items in the Web Application Designer ............................................................ 286
   7.4.1 Properties of Web Templates and Positioning of Objects .................................... 286
   7.4.2 The Table ............................................................................................................ 288
   7.4.3 Text Elements .................................................................................................... 290
   7.4.4 The Generic Navigation Block .......................................................................... 294
   7.4.5 The Drop-Down Box ......................................................................................... 297
   7.4.6 The Radio-Button Group .................................................................................... 301
   7.4.7 The Checkboxes ................................................................................................. 306
   7.4.8 The Hierarchical Context Menu ....................................................................... 308
   7.4.9 Filter .................................................................................................................. 311
   7.4.10 The Label ......................................................................................................... 314
8 Sample Solution for an Extendable Web Cockpit in SAP BW

8.1 Introduction ............................................................................. 367
8.2 Creating the Queries and the Query Views ........................................ 367
  8.2.1 "Time series" query .............................................................. 367
  8.2.2 Query According to Countries and Regions ......................... 369
  8.2.3 Query View for the Chart "Sales Development (Plan/Actual
       Comparison)" ................................................................... 369
  8.2.4 Query View for the Chart "Development of the Relative Margins"
       ......................................................................................... 371
  8.2.5 Query View for the Chart and the Map Graphic
       "Distribution of Sales per Country" ........................................ 371
  8.2.6 Query View for the Map Graphic with Margins ................. 372
8.3 Creating the Web Template with the Charts .................................... 372
  8.3.1 General settings ................................................................... 372
  8.3.2 Web Items and Positioning ................................................ 373
  8.3.3 Assigning Data Providers to Web Items ................................. 376
  8.3.4 Setting the Properties of the Web Items .............................. 378
  8.3.5 Creating Hyperlinks ........................................................ 385
8.4 Creating the Web Template with the Role Menu .......................... 387
8.5 Creating the Title Web Template .................................................. 388
8.6 Creating the Frameset ................................................................ 389
8.7 Linking with Other Reports Using the Report/Report Interface ........ 390
8.8 Navigation in the WebCockpit ...................................................... 392
8.9 The Functions of the Sample WebCockpit .................................... 393
Appendix 395

A Structure of the InfoCubes from Chapter 3 397

A.1 InfoCube "Result calculation actual data (ZCBWTIPP1)" .......................... 397
A.2 InfoCube "Result calculation plan data (ZCBWTIPP2)" ............................ 399
A.3 Multiprovider "Result calculation actual and plan data (ZCBWTIPP3)" 400

B Structure of the InfoCubes from Chapter 4 403

B.1 InfoCube "Result calculation invoice data (ZCBWTIPP5)" .......................... 403
B.2 InfoCube "Result calculation data proj./job accounting (ZCBWTIPP6)" 404
B.3 InfoCube "Result calculation overhead costs (ZCBWTIPP7)" ..................... 406
B.4 MultiProvider "Result calculation for all transaction types (ZCBWTIPP8)" ......................................................... 407

C Bibliography 409

D The Author 411

Index 413
6 Using Sample Solutions to Show the Important Functions of the Query Designer in SAP BW 3.x

Since SAP BW 3.0, SAP also offers a best-practice data warehouse solution in the area of reporting. The optimizations and expansions in the Query Designer represent the core of the improvements. This chapter explains the basic functions and significant changes in SAP BW 3.x.

6.1 Introduction

6.1.1 Calling Up the Query Designer and Creating Queries

Analyses and reports in SAP BW are based on SAP Business Explorer (SAP BEx) queries. You create these queries with the Query Designer, which has been available as a stand-alone PC application since SAP BW 3.0. This application can either be called up via the menu, as a link, or directly (via the executable file wdbrlog.exe) (see Figure 6.1, Step 1). After starting SAP, you must log on to the SAP BW system by entering your user ID and password. Then, you must confirm your logon by clicking on the OK button (see Figure 6.1, Steps 2 and 3).

After logon, the Query Designer is started. To configure a new query, click the New button (see Figure 6.1, Step 4). In the Open Query pop-up, click the InfoAreas button. The InfoArea tree with the respective InfoProviders is displayed. This must then be opened such that the InfoProvider to be used is displayed. Highlight the InfoProvider that you want and select it by clicking on the OK button (see Figure 6.1, Steps 5 to 7).

The selected InfoProvider is then displayed in the Query Designer: New Query popup (see Figure 6.1, Step 8). By clicking on the Technical Name button, you can display the SAP BW keys (see Figure 6.1, Step 9 and the following figures). This is the starting basis for creating queries.
6.1.2 Including Characteristics and Keys in the Query

The result of a query is displayed primarily via a table with similarly configured rows and columns. For the respective rows and columns, selections and calculations can be required. For example, this particular table can consist of columns with keys (in the example: “Gross sales,” “Direct sales reduction,” and “Standard sales revenue,” as well as “COGS” and rows (in the example: Fiscal year/period).

Filter Elements

If global selections are necessary, they can be defined as filter elements (in the example, the SAP “Fiscal year variant,” the “Currency Type,” and the “Value Type” “Actual”).

Free Characteristics

If selections or changes to the row or column criteria are necessary, elements of the type “Free Characteristics” can be defined (in the example these are the “Fiscal year,” “Country,” and “Region”).

Including Info-Objects in queries

You should now define the named query elements. In the Query Designer, you can display the relevant components (those to be selected) of the InfoProvider by opening the object tree in the left frame and clicking the (see Figure 6.2). Using drag & drop, you can move the necessary InfoObjects (characteristics and keys) into the frames for filter values, free characteristics, rows, and columns (see Figure 6.2).
6.1.3 Selections (Restricting)

In general, selections are necessary for queries. Selections are required, for example, so that a particular data type is displayed explicitly (in the example: Value Type “Actual”). In addition, selections can be necessary so that no nonsensical summations occur (from SAP R/3, the CO-PA data can also be provided in addition to the result area currency, for example, also in the accounting sector currency; in the example, a nonsensical doubling of the values is avoided using the selection of the currency type “Result area currency”). Finally, technical selections can be necessary in order to achieve better characteristic displays (in the example, the fiscal year variant “Calendar year, 4 spec. periods” is selected, so that the key display of “Periods/year” occurs without the prefix K4).

The global restrictions are defined in that on a characteristic in the filter frame the context-sensitive menu is opened using the right mouse button and the function Restrict is selected (see Figure 6.3, Step 1). Then, the Selection for fiscal year variant pop-up opens. Select the value that you want and click the Add button (right-arrow button) to add the value (see Figure 6.3, Steps 2 to 4). After confirming this restriction by clicking on the OK button, the restriction is included in the query (see Figure 6.3, Step 5).
Using Sample Solutions to Show the Important Functions of the Query Designer

Figure 6.3 Definition of Restrictions for Global Selections

Figure 6.4 Saving the Query
6.1.4 Saving Queries

After you have defined the query, you must save it. To save the query in a role or in Favorites, click on the Save query button (see Figure 6.4, Step 1). In the Save Query As... pop-up, you must select the storage location (Roles or Favorites) (see Figure 6.4, Steps 2 and 3). After entering the description and technical name, click on the Save button (see Figure 6.4, Steps 4 and 5). Now, you can execute the query.

6.1.5 Executing a Query

To start the query in the HTML browser, click on the Query on the Web button (see Figure 6.4, Step 6). The SAP default Web template displays the result table (see Figure 6.5).

When you click on the Info button, the selected filter values are listed in the query configuration (see Figure 6.5, Step 1). To display the result table again, click on the Table button to display the result table once again (see Figure 6.5, Step 2).

---

**Figure 6.5** Execution of the Query and Navigation: Display of the Filter Values and Selection via Free Characteristics
Selection via free characteristics

If, during the query execution, dynamic selections should occur, in addition to the static filter values, then selection can occur for the corresponding element (characteristic or structural element, for example, a key figure) in the navigation block by clicking on the Filter value button (in the example: selection of the fiscal year 2000, so that only the periods 001.2000 to 012.2000 are listed) (see Figure 6.5, Step 3). In the Filter Value For Fiscal year Choose pop-up, you can select the value that you want (see Figure 6.5, Step 4). After making your selection, the newly selected data is displayed in the browser (see Figure 6.5, Steps 5 and 6).

Changing drill-down

You can also make selections on the basis of the values in the rows and columns. Open the context-sensitive menu and select the value that you want by highlighting it (see Figure 6.6, Step 1). If you only want to display the selection, you must select Keep Filter Value. If in the same step a change of the query drilldown should be made (in the example: display of the countries in the columns for selection of the key "Gross sales"), then you must select the function Filter and drilldown according to ... (see Figure 6.6, Steps 2 and 3).

Figure 6.6 Navigation in the Query: Filtering via Free Characteristics and Table Elements with Change of the Drilldown
6.2 Reusable Objects

6.2.1 The Concept

In practice, the same elements are often required in different queries. This axiom holds true for calculations (calculated keys), restricted keys, and structures of keys or characteristics. In order to store these elements without duplicating them, you can save them as reusable objects. Then, these query elements will be available for all queries that use the respective InfoProvider.

6.2.2 Calculated Keys

If a total should be calculated from different keys, then the formula function is available for the following, for example:

\[
\text{Gross sales} \div \text{Direct revenue reductions} \div \text{Default revenue reductions} \div \text{Full manufacturing costs} = \text{Marginal income II}
\]

You can then define this formula directly in the query. Depending on the construction of the query, you must open the context-sensitive menu on the key node on the row or column, using the right mouse button, while concurrently clicking on the New Formula function (see Figure 6.7, Steps 1 and 2). In the Edit Formula popup, the keys are copied into the Edit Formula window using drag & drop and they are linked with the required operators (in the example, the keys are saved according to the plus or minus sign in the InfoCube and therefore per this example must be linked with a plus sign (+)). Then, you can enter the description and complete the formula definition by clicking on the OK button (see Figure 6.7, Steps 3 to 5). After that, the formula will be available in the query (see Figure 6.7, Step 6).

During query execution, this formula behaves like the physical keys (see Figure 6.8).
Using Sample Solutions to Show the Important Functions of the Query Designer

Figure 6.7 Definition of the Formula in the Query

Figure 6.8 Query with Formula
In practice, however, using the (local) formula conceals the problem that this formula must be defined anew in each query. Besides this unnecessary additional effort, there also exists the problem of inconsistent definitions that arise, thereby contributing to the usage of flawed and contradictory information. The person responsible for creating the query must therefore be sufficiently familiar with the (in practice more complex) data model for such a definition — this basic condition is often not fulfilled. Therefore, reusable formulas (= calculated keys) are recommended. This definition also occurs in the Query Designer.

In the left frame, open the context-sensitive menu on the Key folder symbol using the right mouse button and select the function New Calculated Key Figure (see Figure 6.9, Steps 1 and 2). In the New Calculated Key Figure pop-up, make the definition according to the formula (see the definition of the formula) and confirm the entry by clicking on the OK button (see Figure 6.9, Steps 3 to 5). In the Properties of the Calculated Key Figure pop-up, enter the technical name and also confirm this entry by clicking on OK (see Figure 6.9, Steps 6 and 7). In the Query Designer, the calculated key is then available in the Calculated Key Figure folder and it can be included in the query definition like a physical key using drag & drop (see Figure 6.9, Steps 8 and 9). During query execution, the calculated key behaves like the physical keys (see Figure 6.9, Step 10).
6.2.3 Restricted Keys

In productive applications, calculated keys are also usually separate entities. Only in a dedicated context do these receive meaningful contents. For example, actual data is often compared to budgeted data. Calculated keys and global filters are not suited for this kind of data. Such requirements are mapped via restricted keys: a key—in the example "Marginal income II"—is restricted in one column to actual and in another column to budgeted values.

In the Query Designer, such selection combinations (key and characteristic restrictions) can be created as local definitions. To do this—depending on the query construction—open the context-sensitive menu on the title column or row by right-clicking the mouse button and selecting the New Structure function in the pop-up menu that displays (see Figure 6.10, Steps 1 and 2). Subsequently, in the corresponding frame, an empty Structure appears (see Figure 6.10, Step 3). Again, right-click with the mouse to open a context-sensitive menu and select New Selection (see Figure 6.10, Step 4). The New Selection pop-up opens, in which, using drag & drop, the required key and characteristic selection occurs (in the example: "Marginal Income II" and Value Type = "Actual") and a description is entered (see Figure 6.10, Steps 5 and 6). After you click on the OK button, this definition is available in the query (see Figure 6.10, Steps 7 and 8). During execution, this selection also behaves like a physical key (see Figure 6.10, Step 9).

This definition also behaves correctly in reporting; however, the same problems exist as when executed for the local formula: in practice, the use of the (local) selection conceals the problem that this selection must be defined anew in each query. Besides the unnecessary additional effort, there also exists the problem of inconsistent definitions that arise, thereby contributing to the usage of flawed and contradictory information. The person who creates the query must therefore be sufficiently familiar with the (in practice more complex) data model for such a definition. Therefore, reusable selections (restricted keys) are recommended.
Figure 6.10 Selections of Keys and Characteristic Values in the Query

Figure 6.11 Definition and Use of the Restricted Key
Defining the restricted key

In the left frame, right-click to open the context-sensitive menu on the Key folder symbol and select the **New Restricted Key Figure** function (see Figure 6.11, Steps 1 and 2). In the **New Restricted Key Figure** pop-up, make the definition according to the local selection (see the definition of the locally-restricted key) and confirm the entry by clicking on the **OK** button (see Figure 6.11, Steps 3 to 5). In the **Properties of the Restricted Key Figure** pop-up, enter the technical name and confirm this entry by clicking on **OK** (see Figure 6.11, Steps 6 and 7). In the Query Designer, the calculated key is then available in the *Restricted Key Figures* folder and you can include it in the query definition like a physical key using drag & drop. It also behaves as physical keys do (see Figure 6.11, Steps 8 and 9). An innovation in SAP BW Release 3.x is the possibility of using calculated keys for the definition of restricted keys and vice versa.

### 6.2.4 Definition of Calculated and Restricted Keys with Mutual Dependence

**Basis: calculated keys**

As a rule, during the definition of queries, restricted keys are required (for example, "DB II actual" and "DB II plan," therefore, the key "DB II" with the restriction value type: 020). Both keys are based on a calculation scheme as described in Section 6.2.2, for which the use of calculated keys was recommended (see calculated key “DB II” in Section 6.2.2.). That is, the restricted keys are configured using the definition of the calculated keys (see Section 6.2.3).

This use of calculated and restricted keys minimizes the definition effort, ensures consistent principles—thanks to the common basis—and enables the adjustment of properties in a location.

**Basis: restricted keys**

Nearly as frequently, calculations are required that are based on restricted keys (in the example, Marginal income variance as difference or percentage variance from “Marginal income II actual” to “Marginal income II plan”). The calculated keys are configured using the definition of either the restricted or other calculated keys.

The procedure for the key "Marginal income II variance absolute" (for the absolute variance) should now be presented here. After the restricted keys "Marginal income II actual" and "Marginal income II plan" are configured in the Query Designer, right-click with the mouse button to open the context-sensitive menu on the **Calculated Key Figure** folder and select the **New Calculated Key Figure** function (see Figure 6.12, Steps 1 and 2). The **New Calculated Key Figure** pop-up opens. Use drag & drop to move the restricted keys "Marginal income II actual" and "Marginal
income II plan" into the Formula window. By clicking on the [-] button, the operator is inserted (see Figure 6.12, Steps 3 to 5).

After you have entered the description for the restricted key, you can complete the definition by clicking on the OK button (see Figure 6.12, Steps 6 and 7). After you enter the technical name and click on the OK button in the Properties of the Calculated Key Figure pop-up, this key is based on the restricted keys and calculated with the calculated key (see Figure 6.12, Steps 8 and 9).

For the definition of the key "Marginal income II variance relative" (for the relative variance), the same procedure is selected using the operator Percentage Variance (%) from the list of functions (Percentage Functions folder) in the New Calculated Key Figure pop-up (see Figure 6.12, Steps 10 to 16).

Using drag & drop, you can copy the calculated and restricted keys into the query (see Figure 6.13, Steps 1 to 3). A problem that frequently arises from this kind of calculation is the default display of a number of nonsensical decimal places (see Figure 6.13, Step 4). We will address this issue in Section 6.3.1.
6.2.5 Structures

With the query definition completed according to Figure 6.13, a local structure (in this case: key structure) is formed. This structure is problematic because the definition must be made anew in each query. In addition to the necessary corresponding effort (in practice these structures are often very complex), there is the danger of inconsistent definitions (and therefore, erroneous information).

To avoid this problem, the Query Designer enables you to create reusable structures. Reusable structures can then be copied into various queries. If the structure is changed, then all affected query definitions are changed in the same manner.

To create reusable structures, you would do the following. (Note that the starting point is a structure defined in the Rows or Columns frame in the Query Designer.) Right-click to open the context-sensitive menu on the folder (in the example: Keys) and select the function Save as... (see Figure 6.14, Steps 1 and 2). In the Save Structure As... popup, enter the technical name and description. After you click on the OK button to confirm the entries, the structure is stored globally for the InfoProvider (see Figure 6.14, Steps 3 to 5). In the Query Designer, there is a new folder Structure for this in the left frame with the inventory elements (see Fig-
In the query, the description and technical name are included for this structure (see Figure 6.14, Step 7). In queries to be defined anew, the reusable structure can be copied from the left frame into the query rows and columns using drag & drop.

During query execution, reusable structures behave like local definitions. For many reports, in addition to such key structures, it is also necessary to define characteristic structures. The bases for these characteristic structures are, for example, demands for the formation of interim totals, which cannot be mapped using other solution approaches.

In the example, interim totals must be formed in addition to a detailed listing and a total row for the European and U.S. companies. In addition, in two footers, the shares of the European and U.S. companies of the total must be displayed as a percentage. While the sum total (i.e., the interim totals) and the total could be displayed alternatively using a hierarchy or using navigation attributes, the simultaneous display of shares without structure cannot be mapped. The detailed specification displayed in Table 6.1 emerges with the master data provided.
Using Sample Solutions to Show the Important Functions of the Query Designer

A structure must be created as preparatory work. In the Query Designer, right-click the mouse button on the title of the Rows frame to open the context-sensitive menu. Select the New Structure function (see Figure 6.15, Steps 1 and 2). In the Query Designer, an empty structure is displayed in the Rows frame. On this Structure folder, open the context-sensitive menu, again using the right mouse button, and select the New Selection function (see Figure 6.15, Steps 3 and 4). In the New Selection pop-up that opens, select the company code 0001 and use drag & drop to move the code from the template frame into the selection frame (right) (see Figure 6.15, Step 5). Then, enter the description text and confirm the selection by clicking on the OK button (see Figure 6.15, Steps 6 and 7).

<table>
<thead>
<tr>
<th>Row</th>
<th>Company Code or Formula</th>
<th>Company Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IIT Deutschland GmbH, Flörsheim</td>
<td>Company Code 0001</td>
</tr>
<tr>
<td>2</td>
<td>IIT Consulting AG, Vienna</td>
<td>Company Code 2000</td>
</tr>
<tr>
<td>3</td>
<td>IIT Consulting AG, Madrid</td>
<td>Company Code 2100</td>
</tr>
<tr>
<td>4</td>
<td>IIT Consulting AG, London</td>
<td>Company Code 2200</td>
</tr>
<tr>
<td>5</td>
<td>IIT Consulting AG, Paris</td>
<td>Company Code 2300</td>
</tr>
<tr>
<td>6</td>
<td>IIT Consulting AG, Rome</td>
<td>Company Code 2400</td>
</tr>
<tr>
<td>7</td>
<td>IIT Consulting AG, Amsterdam</td>
<td>Company Code 2500</td>
</tr>
<tr>
<td>8</td>
<td>IIT Consulting AG, Brussels</td>
<td>Company Code 5000</td>
</tr>
<tr>
<td>9</td>
<td>IIT Consulting AG, Moscow</td>
<td>Company Code 6000</td>
</tr>
<tr>
<td>10</td>
<td>IIT Consulting AG, Oslo</td>
<td>Company Code R100</td>
</tr>
<tr>
<td>11</td>
<td>IIT Consulting AG, Copenhagen</td>
<td>Company Code R300</td>
</tr>
<tr>
<td>12</td>
<td>European companies</td>
<td>Total of rows 1 to 11</td>
</tr>
<tr>
<td>13</td>
<td>IIT Consulting AG, Boston</td>
<td>Company Code 3000</td>
</tr>
<tr>
<td>14</td>
<td>IIT America, Los Angeles</td>
<td>Company Code 4000</td>
</tr>
<tr>
<td>15</td>
<td>U.S. companies</td>
<td>Total of rows 13 to 14</td>
</tr>
<tr>
<td>16</td>
<td>Total [Is this right as positioned in the column for Company Code or Formula?]</td>
<td>Total of rows 12 and 15 [???]</td>
</tr>
<tr>
<td>17</td>
<td>Share of European companies</td>
<td>Share rows 12 to 16</td>
</tr>
<tr>
<td>18</td>
<td>Share of U.S. companies</td>
<td>Share rows 15 to 16</td>
</tr>
</tbody>
</table>

Table 6.1 Construction of the Structure for the Company Overview
This selection is therefore taken over into the query as a structure element (see Figure 6.16, Step 1). For the additional company codes of the rows 2 to 11, you must repeat Steps 3 to 7 from the detailed specification according to Figure 6.15.

The interim totals are defined as formula. In the Query Designer, right-click on the Structure folder in the Rows frame to open the context-sensitive menu. Select the New Formula function (see Figure 6.16, Steps 2 and 3). In the New Formula pop-up, the structural elements (rows 1 to 11) must be taken over into the formula using drag & drop and they must each be linked using the operator + (see Figure 6.16, Steps 4 and 5). Then, you must enter the description and confirm the definition by clicking on the OK button (see Figure 6.16, Steps 6 and 7). The interim total is taken over into the query definition as a row element (see Figure 6.16, Step 8).

Then, for the example with the company codes 3000 and 4000 (according to the detailed specification, rows 13 to 14), you must repeat Steps 3 to 7 according to Figure 6.15. For the interim total (according to the detailed specification, row 15), you must repeat Steps 2 to 7 according to Figure 6.16. Then, the total line (according to the detailed specification, row 16) must be formed either according to Figure 6.16 via formula (row...
12 plus 16) or according to Figure 6.15—which is more reliable with respect to new companies—with a restriction-free row.

Thus all required individual positions and total rows are available in the query definition (see Figure 6.17, Step 1). Henceforth, there remains from the detailed specification the mapping of the percentage shares of the interim totals of the total. In the Query Designer, right-click on the Structure folder in the Rows frame to open the context-sensitive menu. Select the New Formula function (see Figure 6.17, Steps 2 and 3). In the New Formula pop-up, using drag & drop, ensure that the structural element with the first interim total (row 12) is taken over into the formula. Also using drag & drop, the function percentage share (%A) must be taken over into the formula and then into the query element Total (see Figure 6.17, Steps 4 to 6).

Then, enter the description and confirm that the definition is taken over by clicking on the OK button (see Figure 6.17, Steps 7 and 8). The percentage share of the first interim total is therefore taken over in the query definition. You must repeat this procedure for the second interim total (row 15) (see Figure 6.17, Step 9).
The detailed specification is mapped in the query as a local structure. In order to make this local structure available as a reusable object, you must right-click on the Structure folder in the Rows frame to open the context-sensitive menu. Select the Save as... function (see Figure 6.18, Steps 1 and 2). In the Save Structure As... pop-up, specify the technical name and description. Then, confirm the entries by clicking on the OK button (see Figure 6.18, Steps 3 to 5).

In the inventory frame, the new reusable structure is provided under the Structure folder. Similarly, the structure in the Rows frame receives the description and the name of the stored object (see Figure 6.18, Steps 6 and 7).

During the query execution, the data of the entire structure is displayed (see Figure 6.18, Step 8). The display of the query result also contains (in the rows with the percentage shares) the problem of display with a nonsensical number of places after the decimal point (see Section 6.3.1 on the display of keys). In addition to the nonsensical display, the formulas produce nonsensical values except in the columns "Marginal income II actual" and "Marginal income II plan." For more information, see Section 6.3.1 on the property "Formula collision."
Using Sample Solutions to Show the Important Functions of the Query Designer

6.3 Properties of Query Elements

6.3.1 Properties of Keys

The properties of keys can be configured in different places in SAP BW. In queries, the properties of keys can be adjusted in two different places: if the setting occurs in local objects in the Rows or Columns frame, this setting affects only the changed query. If the setting occurs in global objects in the Rows or Columns frame, or in the (left) inventory frame, this setting affects all queries that use the changed element.

Changeable properties:
- The description
- The display (e.g., highlighting)
- The numeric display (e.g., number of decimal places and sign reversal)
- The calculations (e.g., cumulative or non-cumulative)
- The currency conversion

Description:
The description can be changed statically or dynamically (for dynamic change see Section 6.7.5). A static change can be necessary if, for example, another text or a multi-line title is required. In the example here, the...
texts of the Marginal income II variance columns require a greater column width than that of the actual data; however, the table width available for the output is often a problem. With a two-line and abbreviated display, the available space is used more efficiently.

In order to change the column title “Marginal income II variance absolute” to the two-line display

Marginal income II variance absolute

in the Query Designer, right-click on the Columns frame to open a context-sensitive menu and select the Properties function (see Figure 6.19, Steps 1 and 2). In the Properties of the Selection/Formula pop-up, specify the desired column title in the Description field and click on the OK button (see Figure 6.19, Steps 3 and 4). The changes are taken over into the query definition (see Figure 6.19, Step 5) and displayed according to the query after saving (see Figure 6.19, Step 6).

Figure 6.19 Changing the Column Title (Description)

In the default display of amounts, nearly all currencies are displayed with two decimal places. This type of setting is not practical for many reports. Therefore, you can change the numeric display, for example, in the calculated key “Marginal income II.” This has the advantage that you can
implement a change that will affect both restricted keys based on this calculated key and therefore the structure itself.

In the Query Designer, right-click on the calculated key "Marginal income II" to open the context-sensitive menu and select the Properties function (see Figure 6.20, Steps 1 and 2). In the Properties of the Calculated Key Figure pop-up, activate the Number of Decimal Places drop-down box and select the value that you want (see Figure 6.20, Step 3). Click on the OK button (see Figure 6.20, Step 4) to save the value. The changed setting will now display during the execution of the query: in the example, the columns "Marginal income II actual" and "Marginal income II plan" appear without places after the decimal point (see Figure 6.20, Step 5).

Calculations

If, in a query with a row feature (e.g., "Company code"), you should not display the amount of a physical, calculated, or restricted key, but you should dynamically display the share of the companies of the total, then you can map this information with the property “Calculate individual values as ...”.
In the Query Designer, right-click on the key “Marginal income II actual” in the **Rows** frame to open the context-sensitive menu and select the **Properties** function (see Figure 6.21, Steps 1 and 2). In the **Properties for the Selection/Formula** pop-up, activate the **Calculate Single Values As...** drop-down box and select the setting **Normalize Overall Result** (see Figure 6.21, Step 3). Click on the **OK** button (see Figure 6.21, Step 4) to save the setting. Now, the changed setting will display during the execution of the query: instead of the display of amounts, the display of the percentage shares of the total will appear (see Figure 6.21, Step 5).

![Figure 6.21 Calculation: Normalization of Total Result](image)

The SAP currency conversion functionality is also available in SAP BW: for example, the currency conversion can occur at the booking time and during query execution. The currency conversion during the query execution can be selected either during the execution or in the query design. In the query design, the configuration of the currency conversion occurs in the course of the properties of keys.

In this example, the amount in the original currency (here: "USD") is contrasted with the amount converted into Euros in an additional key column. Here, two columns with the same data content (here: "Marginal income II actual") must be defined with corresponding column titles.
To set the currency conversion, right-click on the desired column to open the context-sensitive menu and select the Properties function (see Figure 6.22, Steps 1 and 2). In the Properties of the Selection/Formula pop-up, activate the Currency Conversion Key drop-down box and select the desired conversion type (in the example: “Currency Conversion Key ZK03 (ZK03)”) (see Figure 6.22, Step 3). Then, in the property’s Target Currency drop-down list, select the desired currency (in the example: “Euro”) (see Figure 6.22, Step 4). Click on the OK button to save the setting. The settings are taken over into the query (see Figure 6.22, Step 5). After you save the setting, during query execution, the display of the two currencies occurs on the basis of the set conversion type and the stored conversion exchange rate (see Figure 6.22, Steps 6 and 7).

Figure 6.22 Currency Conversion in the Query

6.3.2 Properties of Characteristics and Structural Elements

For characteristics and structural elements, which have no keys, you can set properties regarding display and processing logic.

For characteristics that contain keys and texts, you can set the characteristic display in the Query Designer. If, for example, the display of company codes should be changed so that only the company code designa-
tion appears in a query, proceed as follows: right-click on the desired characteristic to open the context-sensitive menu and select the Properties function (see Figure 6.23, Steps 1 and 2). In the Characteristic Properties for Characteristic Company Code pop-up, in the Display As section, activate the Key and Name drop-down box and select the setting Name (see Figure 6.23, Step 3).

Click on the OK button to save the setting. The settings are taken over into the query (see Figure 6.23, Step 4). After you save the setting, the changed display of the characteristic occurs during query execution (see Figure 6.23, Step 5).

![Figure 6.23 Characteristic Display](image)

For row and free characteristics, you can set the sorting in the Query Designer. Right-click on the desired characteristic to open the context-sensitive menu and select the Properties function (see Figure 6.24, Steps 1 and 2). In the Characteristic Properties for Characteristic Company Code pop-up, activate the Sort Order checkbox (see Figure 6.24, Steps 3 and 4). As for the characteristic-relevant sorting criterion, select the characteristic or attribute in the left drop-down box (see Figure 6.24, Step 4). Specify in the middle drop-down box whether sorting should occur according to name or key (see Figure 6.24, Step 5). Then, specify whether the sorting direction should be ascending or descending in the right drop-down box.
Using Sample Solutions to Show the Important Functions of the Query Designer

(see Figure 6.24, Step 6). Click on the OK button to save the settings. The settings are now taken over into the query (see Figure 6.24, Step 7). After you save the settings, the changed sorting settings of the characteristic are applied during query execution (see Figure 6.24, Step 8).

Highlighting
The setting of properties is also available for characteristic structures. On the one hand, highlighting of total rows, and so forth, is especially required in fixed structures.

Right-click on the desired row or column element to open the context-sensitive menu and select the Properties function (see Figure 6.25, Steps 1 and 2). In the Properties of the Selection/Formula popup, activate the Highlighting drop-down box and select the desired value (see Figure 6.25, Step 3). Click on the OK button to save the setting. The settings are taken over into the query (see Figure 6.25, Step 4). After you save the settings, the changed display is applied during query execution (see Figure 6.25, Step 5).

Although the attributes considered for highlighting are difficult to recognize using SAP style sheets, you can use the many offerings of Web technology to assist you (i.e., individual style sheets, color and font attributes, etc.).
As you can discern from Figure 6.25, attributes for customizing key display—such as the number of decimal places to be displayed—are available. These properties are especially relevant if formula collisions arise in queries with structures in rows and columns that produce nonsensical displays (see Figures 6.25 and 6.26). By setting the number of decimal places in the characteristic structure, you can correct this display.

When you examine the result table in Figure 6.25, you’ll notice the nonsensical values in both right columns in the two bottom rows—as a result of a formula collision. In the example, instead of the actual share of the European and U.S. companies of the variance in the column “Marginal income II variance absolute,” the non-expressive absolute difference of the shares of both company interim totals is displayed as a result of the default formula priority of the column formulas. To realize a correct display, therefore, the formula collision property is available.

Right-click on the desired row or column element (in the example: the rows Share of European companies and Share of U.S. companies) to open the context-sensitive menu and select the Properties function (see Figure 6.26, Steps 1 and 2). In the Properties of the Selection/Formula pop-up, activate the Formula Collision drop-down box and select the value result from this formula (see Figure 6.26, Step 3). Click on the OK button to apply the changes.
button to save the setting. The settings are taken over into the query (see Figure 6.26, Step 4). After you save the settings, the changed formula priority is applied during query execution and the formula is applied (in the example, the sensible RowFormula (see Figure 6.26, Step 5).

Figure 6.26 Setting of the Query Behavior in Case of Formula Collisions

6.4 Hierarchies

6.4.1 Introduction

The hierarchical display of data is very significant for professional reporting. On the one hand, much reporting-relevant data is organized hierarchically: the aggregation across materials occurs based on the product hierarchy; the aggregation across customers occurs based on the customer hierarchy; the structure of the balance sheet and the income statement follows a hierarchical structure, and so forth.

In many databases, data warehouses, and management information systems, hierarchies are mapped exclusively across attributes or summarizing characteristics. This type of mapping is suitable for only some of the demands. Because most hierarchies are not leveled (that is, not all “leaves” are on the same hierarchical level), the correct mapping of hierarchies is vital for many analytic demands.
With SAP BW, SAP provides a complete solution for the correct mapping and use of hierarchies. This solution organizes the master data object (characteristic "account," "customer," "material," etc.) into hierarchies, which can be used for each evaluation in which a hierarchy-bearing characteristic is used.

6.4.2 The Use of Hierarchies in the Query Designer

If there are one or several hierarchies for a characteristic, you can set these hierarchies in the Query Designer as a display property. During query execution, the specified hierarchy is displayed.

Right-click on the desired characteristic (in the example: "Country") to open the context-sensitive menu and select the Properties function (see Figure 6.27, Steps 1 and 2). In the Characteristic Properties for Characteristic... pop-up, click on the button for hierarchy selection (see Figure 6.27, Step 3). The Select Hierarchy pop-up opens. Select the desired hierarchy by highlighting it and confirm your selection by clicking on the OK button (see Figure 6.27, Steps 4 and 5). Then, enter the selected hierarchy (in this example: "Country") in the Characteristic Properties for Characteristic... pop-up and click on the OK button to confirm your selection.

The settings are taken over into the query definition (see Figure 6.27, Steps 6 and 7).

The setting that displays the characteristic as hierarchy during query execution is visualized in the Query Designer (see Figure 6.28, Step 1). During execution of the query, the hierarchy is displayed according to the customizing settings you applied (see Figure 6.28, Step 2). In addition to the functions possible for lists of characteristic values (navigation and editing of the settings by clicking on a value, etc.) with the hierarchy, there are also additional functions available: by clicking on the hierarchy node symbol (▼ for opened and ► for closed partial trees), you can open or close the entire hierarchy and/or a partial tree (see Figure 6.28, Step 3). Also, the context-sensitive menu offers special functions (activate/deactivate hierarchy, expand the entire hierarchy up to a specified level, etc.) for hierarchies on hierarchy nodes or hierarchy leaves (that is, characteristic values).
Using Sample Solutions to Show the Important Functions of the Query Designer

Figure 6.27 Configuration of the Hierarchy Display in the Query Designer

Figure 6.28 Display of the Hierarchy During Query Execution
Hierarchies

The same steps are required if you want to display a hierarchy in the columns. During the execution of a query, the same functions are available (see Figure 6.29).

You can also display various hierarchies simultaneously in the rows and columns. The mixed display of hierarchies and characteristics has been supported since SAP BW 3.0. The display can occur without additional settings (see Figure 6.30, variant 1: hierarchy and characteristic, variant 2: characteristic and hierarchy).

If desired, the mixture of hierarchies and characteristic values can also be displayed hierarchically: in the Query Designer, right-click on the title of the Rows frame to open the context-sensitive menu and select the Display as a Hierarchy function (see Figure 6.31, Steps 1 and 2). Afterwards, the hierarchy symbol is added to the frame title (see Figure 6.31, Step 3). After you save the query, all breakdowns in the row—regardless of whether they are hierarchy or characteristic breakdowns, or a mixture of hierarchies and characteristics—are displayed hierarchically (see Figure 6.31, Step 4, as well as Figure 6.32, Steps 1 and 2).
Figure 6.30 Hierarchy and Characteristic Displayed Mixed

Figure 6.31 Hierarchies and Characteristic Drilldowns as Hierarchy

Using Sample Solutions to Show the Important Functions of the Query Designer
Key hierarchies can be formed via the function **Display as a Hierarchy** (see Figure 6.33, Step 1) and the option of the hierarchical arrangement of keys (leveling function).

As preparation, you can use drag & drop to copy all desired keys into the Rows frame. After that, you can use the Level Down function as often as necessary to display the keys in hierarchy nodes or hierarchy leaves until these leaves are positioned on the key tree as desired. In the Query Designer, right-click on the key to be positioned and select the Level Up function (see Figure 6.33, Steps 2 and 3). After you save the setting, the keys behave like a hierarchy during query execution (see Figure 6.33, Step 4). Therefore, the aggregation behavior and the calculation of the respective keys is not changed.
6.5 Conditions

6.5.1 The Concept and the Available Types of Conditions in SAP Business Explorer

Conditions control the restriction of the result area in SAP BW queries; however, they have no influence on result rows—the result row corresponds to the result row of the query without this condition. Several conditions can be defined for a query. They are connected logically with AND; that is, different conditions affect the query simultaneously, insofar as all are active.

Using conditions, you can restrict the view of the data of a query as follows:

- **Absolute conditions**
  A row is filtered independently of the other rows if its reference value exceeds a particular threshold value. The available restrictions are:
  - Equal to/not equal to
  - Less than/greater than
  - Less than or equal to/greater than or equal to
  - Between/not between
Ranking lists
Here, all rows of the displayed list are considered and their relationship to one another determines whether the row will be displayed. Ranking lists are always sorted automatically. The following operations are available for the creation of ranking lists:
  - Top N, bottom N: the ranking lists reflect a particular number.
  - Top percent, bottom percent: the ranking lists reflect a certain percentage.
  - Top total, bottom total: the ranking lists represent a particular total value.

6.5.2 The Use of Conditions in SAP Business Explorer
An example of the application of an absolute condition is the analysis of the relevant markets by eliminating low-ranked values. In the example, all regions with 5,000,000 Euros and more must be displayed; the other regions must be excluded from the display.

Click on the Condition button in the Query Designer and select the New Condition function (see Figure 6.34, Steps 1 and 2). In the Define Condition pop-up, a description is specified, and via activation or deactivation of the Active option, you determine whether or not the condition should be applied automatically during query execution (see Figure 6.34, Steps 3 and 4).

Because this absolute condition is not practical in every drill-down state (if an additional drill-down—for example, according to periods—occurs within the regions), click on the option box under the property Evaluate the conditions displayed below for single characteristics or combinations of characteristics and select the desired characteristic (in the example, the "Region") (see Figure 6.34, Steps 5 and 6). Then, click on the New button to see the display of drop-down boxes and input fields for specifying the condition (see Figure 6.34, Step 7). Activate the drop-down box for selecting the keys and select the desired key (in the example: "Marginal income II actual EUR") (see Figure 6.34, Step 8). Then, click on the drop-down box for selecting the operator, and select the desired operation (in the example: “Greater than or equal to”) (see Figure 6.34, Step 9). Specify the desired threshold value in the Values input field, and then click on the Transfer button (see Figure 6.35, Steps 1 and 2).

The condition is then adopted into the list. Complete the definition of the condition by clicking on the OK button (see Figure 6.35, Steps 3 and 4).
After you save the defined condition, it is applied automatically during query execution (see Figure 6.35, Step 5).

**Figure 6.34** Absolute Condition, Part 1

**Figure 6.35** Absolute Condition, Part 2
An example for the application of a ranking list is the analysis of the relevant values of the drill-down characteristic "Selection" of the respective top values. In the example, those values should be listed independently for all characteristics in the drilldown that collectively represent at least 80% of the total result.

The definition is analogous to that of the absolute condition. Deviating from the example with an absolute ranking list, in the present example, the condition is applied for all characteristics in the breakdown. As operator, Top % is selected and the associated percentage value (in the example: 80%) is entered (see Figure 6.36, Steps 1 to 4).

You conclude the definition of the condition by clicking on the OK button (see Figure 6.36, Step 5). After you save the definition, the condition is applied automatically during query execution (see Figure 6.36, Step 6). As many values as necessary are displayed in the list (automatically sorted in ascending order) until the threshold value is reached, or it is exceeded for the first time.

**Figure 6.36  Ranking List Condition**

If, in the query, you navigate to another list criterion (in the example: via context-sensitive menu to “Country”), then the defined condition is applied to this characteristic as well (see Figure 6.36, Steps 7 to 9).
To ensure that conditions will not simply be defined statically in the Query Designer, you can also define conditions during the execution of a query (see Figure 6.37).

To apply the defined condition in runtime, click on the Table button, and the result table is displayed (see Figure 6.37, Steps 9 and 10).
Index

A
ABAP/4 text elements 362
Administrator Workbench 41f.
   Business Content view 74
   InfoObjects view 72
   InfoProvider view 83, 88, 112, 120, 126
   InfoSources view 91, 123, 127
   modeling view 76
   source system view 109f.
Aggregate 162
ALE 41
Alert monitor 32
Application components, creation 91
Application link enabling 41

B
Balanced scorecard 19
   cause-and-effect relationships 36
   permeating the company from top to bottom 34
   perspectives 35
Balanced scorecard method of management 33
BAPI 42
Bar charts 325
BasicCube 44
Business Content
   activating 74
   activation 76
   DataSources 101
   object selection 76
Business Explorer 54
Business intelligence 25
BW URLs 277

C
Cascading StyleSheets 281
Characteristic
   creation 79
   display breakdown as hierarchy 235
   hierarchies 43
   key figure 152
master data 43
master data ID 44
properties 228
texts 43
time-dependent texts 44
Characteristic display
   key 229
   name 229
Characteristic variables 245f.
Characteristics 43
Communication structure 51, 119
Communications structure 94
Components of the WebCockpit 373
Condition 238
   absolute 238
   defining 239
   definition during the query execution 242
   not active 242
   ranking lists 239
Core competency, global 24
Crystal Reports 56
CSS 281
Currency conversion 227

D
Data element PRODH_D 167
Data model
   account-oriented 146
   column-oriented 143
   compare 147
   key figure-oriented 143
Data provider 277
Data retrieval 49
   master data attributes 97
Data sources
   database systems 49
   non-SAP systems 49
   SAP systems 49
   structured interface files 49
   XML files 49
Data warehouse 27, 41
DataSource 50
   application-specific 107
generate 109
InfoSource to 110
replication 109
setting up selection fields 107
setup 107
DataSources, Business Content 50
Decision support system 26
Direct update of master data 91
Document links 264
Domain PRODH 167
DSS 26

E
EIS 26
ETL process 28, 41, 50
Exception, defining 243
Exceptions 243
Execute Web template 285
Executive Information System 26
External data 33

F
Fact table
   many data records 143
   record length 143
Filter 207
Formula Collision 231
Formula Variables 245, 259
Formulae 211
Frameset 347, 389
Function, percentage share (%A) 222

H
Hierarchies 233
Hierarchy, reporting 181
Hierarchy and characteristics, common display 235
Hierarchy display, leading column 233
Hierarchy node variable 245, 254
Hierarchy selection 233
Hierarchy Variables 245, 252
Highlighting 230
HTML 275, 359
HTML code, manual editing 361
HTML forms 364
HTML tables for positioning 373
HTML tags 359
Hyperion 25
Hyperlinks 385

I
Identification of participating characteristics 89
Individual cells, calculations with … 265
InfoArea 44
   create 72
InfoCube 83
   activation 86
   activation of navigational attributes 86
   aggregate 48
   assignment of characteristics to dimensions 86
   BasicCube type 83
   creation of dimensions 84
   dimensions 44
   dimensions ID 44
   fact table 44, 143
   line items 46
   managing data targets 122
   management 122
   order/project settlement 152
   overhead costs 152
   star schema 44
   transfer characteristic 84
   transfer of key figures 84
   transfer time characteristic 84
   use of capacity 145
   use of capacity of cells 143
   InfoCube design, Analyzing the source data 148
   infoObject, create 73
   InfoObject Catalog, record InfoObject 74
   InfoObject catalog
      characteristic type 79
      create 73
      transfer characteristic 83
   InfoObjects 42
   InfoObject catalogs 44
   InfoPackage
      create 98, 127
create for SAP R/3 data 120
creation for transaction data 127
data selection with ABAP routine 122
external data 94, 98
Processing 94
processing 98
schedule 96, 129
selection using subroutine 160
set up 94
update 96
InfoPackages 53
InfoProvider 83
InfoSet 47
master-data-bearing 47
RemoteCube 48
virtual InfoCube 48
InfoProviders 44
Information distribution 32
InfoSource 51
assignment 110
assignment of DataSource 92
Assignment of source system 92
creating 110
creation 91
transfer rules 98
transfer structure 98, 104
Inmon, William H. 41
Integration 30
operative processes and analytical applications 30

J
JavaScript 277, 364

K
Key
calculate individual values as ... 226
calculated 211, 213
hierarchy 237
number display 225
number of decimal places 226
properties 224
restricted 211, 216
Key figure 43
calculated 164
create 73
non-cumulative 44
restricted 164

M
Main data query 273
Maintain sender/receiver assignment 390
Management Cockpit 367
Management cockpit 31
Management information system 26
Map chart 331
navigation 336
Map level 334
Map renderer 337
Master data
maintain 96
maintenance 105
Material attribute, product hierarchy 167
Metadata exchange 42
MIS 26
Monitor 53, 96, 122
Monitoring 41
MultiProvider 47, 83, 87, 151f.
creation 88
identification of participating characteristics and key figures 89
making queries 164
relevant InfoProviders 89
selection
source of key figures 91
mySAP CRM 69

N
Navigation in the WebCockpit 392
Navigational attribute 79f.
No update 112
Non-SAP source systems, connection 41

O
ODS objects 46
OLAP 28
Online analytical processing 28
Open Hub 41, 65
Oracle 25

P
PeopleSoft 25
Persistent Staging Area 54, 94
Pie charts 327
Portal technology 32
Positioning in Web Templates, insert table 287
Process chains 53
PRODH_D 167
Product Hierarchy, flexible update for level-oriented 189
Product hierarchy
OPROD_HIER_LPRH_HIER 178
basic data 1 167
comparison of variants 200
DataSource for level-oriented 185
generate extractor for hierarchy 176
InfoObject for step just 186
level number 169
navigation attribute for material 171
problems 178
problems with SAP Business Content 174
Reporting based on step just 198
Sales/sales organisation 2 167
SAP Business Content attribute in reporting 173
SAP Business Content DataSource 171
SAP Business Content InfoObject 169
step just 184
texts table T179T 168
value ranges Tabelle T179 168
Property
characteristic display 228
sorting 229
Propose transfer rules 93
PSA 54, 94

Q
Queries, saving 209
Query
characteristics 262
columns 206
display in the Web 209
display on the Web 135
execute
Analyzer 139
currency translation 137
dynamic graphics 139
filter and drilldown according to...
137
several leading columns 137
execution 134
selecting filter value 135
Filter 206
free characteristics 206
rows 206
save 134, 209
saving in a role 134
select InfoProvider 205
Query Designer 205
button
technical name 130, 205
filters 134
formula
percentage variance 133
formulas 130
hiding a key figure 131
start 129
starting 205
structure 131
taking over InfoObjects in queries 206
transfer of InfoObjects into query 130
Query element
properties 131
restricting 133
Query execution, filter and drilldown according to ... 210

R
Record type
billing document 148
order/project settlement 148
record type, Incoming sales orders 148
Remote Function Call 41
Report/report interface 390
report/report interface 393
Reporting, performance problems 146
Reporting Agent 32, 55
Restricted role menu 393
RFC 41
Role-based menu structures 31
SAP Advanced Planner & Optimizer 69
SAP APO 69
SAP BEx 54
SAP Business Content 66, 74
SAP Business Explorer 48, 54, 129
ad hoc queries 61
Analyzer 55, 62
bookmarks 63
calculated key figures 57
conditions 58
exception 58
executing queries 59
formulas 57
iView 63
limited key figures 57
master data reporting 56
Mobile Reporting 63
mobile reporting 55
personalization 55, 63
Query Designer 54, 56
Reporting Agent 63
structures 57
tabular reporting 56
URLs specific to SAP BW 60
variables 57
Web Application Designer 54, 59
Web Applications 55, 61
Web Report 134
Web Templates 59
SAP Business Explorer Analyzer 139
SAP Business Explorer queries 205
SAP Business Explorer Query, create 129
SAP Business Information Warehouse
as core component 69
SAP BW Document Browser 264
SAP BW JavaScript function 365
SAP BW text 393
SAP BW URL 393
SAP Customer Relationship Management 69
SAP Enterprise Portal 55
SAP R/3 22
SAP R/3 CO-PA, record types 143
SAP R/3 DataSource, setup 107
SAP SEM 69
SAP source system, connection 41
SAP Strategic Enterprise Management
69
SAP Web Application Server 60
SAP_BW_TEXT 361
SAP_BW_URL 363
SAS 25
Scheduler 53
(maintain InfoPackage) 94
Scheduling 41
Select query 283
Select style sheet 286
Selecting data, user exit in the update rules 155
Single point of entry 31
Software, transactional 21
Source system 50
Star schema 44
Strategy 34
Strategy map 36
Structural element, properties 228
Structure 218
characteristic structure 219
key structure 219
reusable 218
Supplemental data retrieval 102
Tabular Reporting 268
Text variables 245, 257
Third-party extraction tools 42
Third-party front-end tools 65
Business Objects 65
Cognos 65
dynaSight 65
inSight 65
Third-party reporting tools 42, 56
Transaction RSA11 83, 88, 112, 126
Transaction RSA12 91, 123, 127
Transaction RSA13 109
Transaction RSA14 72
Transaction RSBB5 390
Transaction SBIW 107
Transfer rules 51, 92
maintenance 110
Transfer structure 50, 92
defining (transaction data) 124
Transformation of data into information 31
Update
   data destination-dependent 162
   result table 157, 159
   return table 157, 159
Update method
   formula 115
   routine 119
   source key figure 113
Update rule
   Detail 113
   formula
      NEGATIVE 117
Update rules 52
   change source 126
   constant 127
   create
      rules 113
      creating 112, 126
   formula function 115
   source InfoObject 113
   time reference 113

Variable, user entry/default value 246
Variables 245
   calculating with ...(acquire previous year) 250
   Offset 250
   processing types 246
   types of ... 245
Variables process type
   customer exit 246
   SAP exit 246
Variables processing type
   authorization 246
   replacement path 246
Visible map area 333
Vision 34

Web Application, formatting 281
Web application 277
   language-dependent texts 361
Web Application Designer 276, 282
   layout 287
Web application with several map levels 339
Web Application Wizard 277, 282
   Edit attributes 283
   Publish Web template 285
   Save Web template 285
Web Design API 60
Web Item
   Select 283
   table 288
   text elements 290
Web item 277
   ABC classification 281
   Ad-hoc Query Designer 281, 353
   Alert Monitor 280, 339
   chart 278, 324
   checkbox 278, 306
   drop-down box 278, 297
   filter 279, 311
   generic navigation block 279, 294
   hierarchical context menu 279, 308
   individual document 280, 348
   label 279, 314
   list of conditions 280, 320
   list of documents 280, 351
   list of exceptions 279, 318
   map 331
   radio button group 278, 301
   role menu 280, 342
   simulation prediction 281
   table 278
   text elements 279
   ticker 322
Web item-related properties 286
Web items, label and filter combination 318
Web Template, positioning objects 287
Web template 277
   HTML code 359
   WebCockpit 367
   WYSIWYG 366
XML protocol 41